

Explaining Desirability Indicators and Components of Multi-grade Classes Comparing Existing Educational space of these Classes with Desirable Indicators in two Prosperous and Nonprosperous Provinces

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ABSTRACT

This study aimed at explaining and identifying desirability indicators and components of educational space of multi-grade classes comparing current situation of educational space of these classes with desirable indicators; for this purpose, the combined approach- qualitative with exploratory type and quantitative with descriptive-analytical type- was used. Statistical population of study consisted of experts and teachers of multi-grade classes in prosperous and Non-prosperous provinces; these members were selected using purposeful sampling method. Semi-structured interview was used as research instrument in qualitative part and current situation was observed in descriptive-analytical method based on indicators and components of educational space of multi-grade classes. Coding and categorizing applied to analyze data obtained from interviews. To determine reliability of data, extracted categories were given to interviewees. Findings indicated that desirability components of educational space in multi-grade classes consisted of color, light, audio pacification, ventilation, classroom arrangement, area, auxiliary facilities, cooling, heating, computer and instructional materials. Moreover, findings showed that multi-grade classes in prosperous provinces was at optimal level in terms of color, light, audio pacification, ventilation, heating, and computer facilities while this criterion was at average level in terms of classroom arrangement, area, auxiliary facilities, cooling, and instructional materials. Multigrade classes in non-prosperous provinces were optimal in terms of light and ventilation while at lower than average level in terms of other indicators.

KEYWORDS

Desirability Indicators and Components, Multi-grade Classes Comparing, Educational space, Desirable Indicators, Prosperous and Nonprosperous Provinces

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Introduction

Nowadays, all educational systems are organized based on the age and grade. Elementary students are categorized to two groups of mono-grade (based on age) and multi-grade classrooms (Little, 2006). In some countries, a teacher teaches students of seven different grades in one class (Kamel, 2012). Sometimes a teacher in Iran teaches to 6 grades and one group of pre-elementary children simultaneously (Mortazavizadeh, 2015). † Multi-grade teaching is not a new approach to teach and can be found in many of educational systems all around the world; a large number of teachers teach in multi-grade classes as multi-grade teaching is common in majority of educational systems of the world and the number of multi-grade classes is increasing (Mason & Stimson, 1996). Such classes exist in some areas of Asia and Africa, in particular in remote rural areas; hence, International Scientific Cooperation Office expanded primitive teachings for multi-grade classes in a large scale (Unesco, 2007). This kind of teaching is better than mono-grade teaching in some cases (Nawab & Baig, 2011). In many of countries, deprived students living in poor families who live in tribes in remote mountainous areas may study in such classes (Pridmor, 2007). Geographical, historical, political, and economic factors can be mentioned as some reasons for establishment of multi-grade classes in Iran so that this method is used to meet the need for public education also as a solution for educational justice actualization. Educational space of class is one of significant factors affecting learning and teaching process. Educational space is a context in which, learning-teaching process occurs so that this process is affected by it and unfavorable environment may cause problem in curriculum (Fathi Vajargah, 2015). Educational space usually encompasses two physical and cultural dimensions. Physical dimension consists of school space, green space, educational buildings (classes, laboratories, workshops, computer center, and multifunctional hall, audio and visual center) that form education and learning space. Cultural dimension depends on abilities and merits of staffs, their behavior, communication between staffs and responsibility of individuals (Zamani & Nasr, 2007). International studies have emphasized on importance of design of school's space in learning and success process (Darmody & Smyth, 2010). Physical space has considerable effects on learners as an active and dynamic factor for quality of educational activities; physical space consists of message for students and effects on learning rate, individual and social personality, and mental health of students (Shaterian, 2012). Class environment as well as internal and external space of school can make learning process of students meaningful; moreover, physical spaces of class plays the role of a teacher for students making them aware of subjects and obtain experience (Unesco, 2013). Many of school buildings have been damaged in Iran due to various reasons; hence, these buildings are not compatible with happy environment of science and knowledge. In such schools that have a physical space leading to fatigue, irregularities, and lack of focus among students, educational goals cannot be fulfilled (Bakhtiar Nasrabadi, 2001). The studies conducted in field of multi-grade classes can help finding problems and educational shortcomings and the results of such studies can be used in Iran since such classes are attended in Iran. Therefore, Iranian researchers tend to find some solutions to solve problems of these classes and improve teaching

quality. There has been any study in field of educational space of multigrade classes in Iran and foreign countries; hence, the extant study can help researchers find the solution in this field. Veenan (1997) carried out a comprehensive study on multi-grade teaching within a wide range of countries and reported no difference between cognitive and non-cognitive implications between monograde and multi-grade classes. Evidences indicate that although teaching in multi-grade classes may be high, teaching methods in such classes are not ideal (Mulryan, 2007). According to studies, physical facilities of school can considerably effect on performance of students and effectiveness of teachers' tasks. Comfortable class, suitable temperature, calm conditions, new building, and small number of students can be named as important physical factors (Zamani & Nasr, 2007). There have been many studies conducted in field of comparing current educational spaces with global standards; these studies are as follows: Institute for Standardization and Industrial Research (1984), Ghazizadeh (1994), Yazdanpanah (1994), Mirzaee (1997), Ibrahimi Dastgerdi (1997), Zamani and Nasr (2007), Tavoni and Asefi (1998), and Karimi (2008). Majority of these studies concentrated on educational space of monograde classes while evidences indicate that some factors such as number of grades, gender, age, and interests of students have not been considered in design of educational space of multi-grade classes, because a room has been constructed for educational space of multi-grade classes in Iran due to small number of students regardless of the nature of these classes or educational space of these classes have been first considered for mono-grade classes then has changed to multi-grade classes because of families immigration or reduction in student population. Therefore, differences between educational space of mono-grade and multi-grade classes have not been considered in studies. The majority of educational spaces of schools in Iran are not compatible with psychological properties of children and adolescences; so, they might effect on social-behavioral performance as well as vision and attitude of them toward education (Tabaian, Habib & Abedi, 2011). Farahbod and Gharib (2014) conducted a study and found existing environment of classes in Iran undesirable recommended revising educational space of schools. In addition, Molaee (2005) indicated weak physical situation of elementary schools in Tabriz. Danesh Mehr (1998) found inappropriate distribution of elementary schools in Tabriz considering criteria for elementary schools' establishment and majority of schools had unsuitable constructional situation. Darmody and Smyth (2010) found various environmental factors such as light, in particular natural light, ventilation, proper temperature, lack of disturbing noises inside and outside of the building that could significantly effect on teaching and learning. According to national report of Thames (2002) about position of educational facilities in performance of students, quality of class air, temperature and humidity, ventilation and light conditions, and high-quality audio can be mentioned as significant factors. This study showed a correlation between high quality of building, better lightening, thermal comfort, air quality, access to laboratories and libraries, and success of students (Qouted from Azzi & Roberto, 2007). Considering the vital role of educational space in teaching-learning process of students and its complicity with mental-physical properties, gender, growth stages, and distinguished nature of multi-grade and mono-grade classes, this study was conducted to find respond to the following questions: 1. What are utility and desirability indicators for educational space of multi-grade classes? 2. How is the current situation of

educational space of multi-grade classes in prosperous and nonprosperous provinces? 3. How is the educational space of multi-grade classes in viewpoint of teachers?

Method

Method This study was conducted based on combined approach considering the nature of studied subject. This was a qualitative approach with exploratory type and a quantitative approach with descriptive-analytical type. Statistical population of study consisted of existing references in this field, experts, teachers, and multi-grade classes in prosperous and non-prosperous provinces. To select sample members, purposeful sampling method was used. Purposeful sampling method is used when individuals are chosen based on their complete information about the subject (Gall, Borg and Gall, 2008, P. 389). To select sample size, the conducted studies in this field were studied then some experts were selected. Experts had published papers or instructed dissertations in this context. Teachers were those who had been interested in teaching in multi-grade classes more than 10 years; the selected teachers had more than 3 grade classes and lived in village. Since the main bases were teachers, their classes were selected as statistical samples. In general, experts were selected for interview based on their experience and information about the subject while teachers were selected based on their experience in multi-grade classes. Statistical sample consisted of 8 country specialists, 16 experienced teachers of multi-grade classes, and 30 multi-grade classes (15 multi-grade classes in each province). Experts, teachers, and number of classes were selected using purposeful sampling method. Semi-structured interview was used as research instrument in qualitative part. To determine reliability of data, extracted categories were given to interviewees. Current situation was observed in descriptiveanalytical method based on indicators and components of educational space of multi-grade classes; in this case, researcher observed and scrutinized various dimensions of educational space attending in multi-grade classes based on Table 1. 4 Interview was based on research objectives and confirmed by professors. Interview began with general questions then the next questions were asked to complete the interview and obtain more rich data based on type of participants' answers. 4 experts were interviewed in their offices while other experts were not interviewed as they were in different provinces so that questions were sent to them through e-mail and written answers were obtained. The objective of selecting two prosperous and non-prosperous provinces was to compare current situation of educational space in these provinces. To convert qualitative data to quantitative type, indicators became quantitative using 5-point Likert scale from very appropriate to very inappropriate; accordingly, each indicator scored from 1 to 5. Score 3 was considered as benchmark so that the score lower than 3 was below average and the score above 3 was above average.

Findings

Findings Question 1: What are desirability indicators and components for educational space of multi-grade classes? According to the relevant references and interview with experts in this field, 11 options were identified as desirability indicators of educational space of multi-grad classes that indicator of each component is indicated in table 1. Components and indicators contained in table are codified based on various references emphasizing on criteria of educational

spaces in Iran (2007). According to Ghazizadeh (1994), these criteria have been codified based on surveys in criteria of different countries and educational system of Iran considering real needs of society and economic conditions in order to present some criteria that contribute to creating desirable spaces with correct performance. The proposed criteria in this collection have been prepared based on minimum educational needs; hence, they should be followed in design.

Table 1. Desirable components and indicators for educational space of multi-grade classes

Row	Components	Indicators	References
1	color	color of class floor: white, gray or bright color of ceiling: white; color of walls: opaque; color of desk and bench: opaque; color of board: black or green	Unesco (2013); criteria and principles of educational space (2007); findings in field of educational space (2008); experts' opinions
2	light	light in two ways: natural light through door and windows (20% of class's area); artificial light: maximum of 2 lamps	Unesco (2013); criteria and principles of educational space (2007); findings in field of educational space (2008); Experts' opinion; Shabani (2010), Mathot (2001)
3	audio pacification	door, windows, teacher's voice, students' voice, voice of desk and bench	Unesco (2013); criteria and principles of educational space (2007); findings in field of educational space (2008); Experts' opinion; Shabani (2010); Mathot (2001)
4	ventilation	door, windows artificial	Unesco (2013); criteria and principles of educational space (2007); findings in field of educational space (2008); Shabani (2010), Mathot (2001); Experts' opinion
5	class arrangement	class's area, number of students desk and bench number of grades	Unesco (2013); criteria and principles of educational space (2007); findings in field of educational space (2008); Shabani (2010); Safavi (2014); Mathot (2001); Experts' opinion
6	area	per 3 students	criteria and principles of educational space (2007); findings in field of educational space (2008); experts' opinions
7	auxiliary facilities	cloth hanger, rest space, closet, shelve	Unesco (2013); Mathot (2001); criteria and principles of educational space (2007); experts' opinions
8	cooling	windows, cooler and fan	Mathoth (2001); criteria and principles of educational space (2007); findings in field of educational space (2008)
9	heating	radiator, gas heater, oil heater, windows' glass, electricity	Mathoth (2001); criteria and principles of educational space (2007); findings in field of educational space (2008); Experts' opinion
10	computer	laptop, computer, printer, instructional CD, internet	Mathoth (2001); criteria and principles of educational space (2007); findings in field of educational space (2008); Experts' opinion
11	instructional tools	prepared, hand-made, waste tools, appliances, instruments existing in nature	Unesco (2013); Mathot (2001); criteria and principles of educational space (2007); findings in field of educational space (2008); Experts' opinion; Shabani (2010); Safavi (2014)

Each component is explained herein. 1- Color: color is one the most attractive and effective phenomenon in life so that is close to human feelings and affection more than any visual element (Amir Teimouri); Azzi, Katrin and Roberto (2007) believe that walls' color can effect on students' attitude toward education and training. Colors convey a specific message to viewers and this subject has been always considered by scientists and psychologists so that there



have been numerous researches about color psychology over the recent years (Tabaian, Habib & Abedi, 2011). Selection of color for elementary classes is as follows: ceiling: white and bright, class floor: white and bright gray, class' ceiling, walls, desks and benches: opaque, color of class's board: black or green (Iranian academic center for education, culture and research, 2008). In this regard, each component that has the determined color obtains score 1; otherwise, it is scored 0.

2- Light: learning circumstances and physical space such as light, class air, instructional tools and facilities can effect on students' learning (Shabani, 2011). Light is a significant factor in class affecting study (Azzi, Katrin & Roberto, 2007). It would be better if educational spaces are connected to outside space through windows in order to provide mental health of child. To have sufficient light in educational spaces, not only natural light should be used through door and windows but also artificial light is required (Iranian academic center for education, culture and research, 2008). To test light status, opening door of class to outside obtained score 1, window (maximum of 2 windows) obtained score 1 for each window, and lamp (maximum of 2 lamps) obtained score 1 for each lamp.

3- Audio pacification: suitable voice is an underlying element in class that affects understanding level and verbal communication of student (Azzi, Katrin & Roberto, 2007) while inappropriate condition of voice may lead to distraction or interference with study, because any activity in class should be done in a quiet and secure audio environment. The meaning of audio pacification means that teaching to one of grades is not along with a disturbing voice for other students. However, audio intruders outside the class such as animals' voice, crowd voice, cars' voice, and mosques' voice have not been examined in this research because of different reasons. Low space of class is one of problems in multi-grade classes so that students make noise when walking between desks and benches. Metal doors of class make disturbing noise. These noises distract teacher and students leading to sound pollution. Teachers should speak quietly and students should be silent to hear teacher (Mathot, 2001). It should be noted that correct listening is one of significant education principles. Students cannot focus perfectly when there is disturbing noise; in this case, educational activities are not done well. Spatial situation of schools and their wrong location- at noisy areas, lead to reduced educational efficiency in class. Class should be located in a calm place without any noise since studies have indicated that sound pollution in schools leads to reduced concentration, interrupted studying, and academic failure of students (Golmohammadi, 2005).

4- Air conditioning: suitable temperature is an essential factor to prevent from exhaustion (Azzi, Katrin & Roberto, 2007). Air conditioning can be done using window, ventilator, etc. to change class's air in all seasons and climates. Good air conditioning is an essential factor in educational space of class to provide health of children preventing them from antiqueness during studying. For this purpose, class's air should be changed two to three times per hour.

5- Classroom arrangement: classroom arrangement is determined considering curriculum, number of students, classroom's area, teaching method and expectations of teacher. Classroom arrangement depends on available facilities and equipment in village (Mathot, 2001). In addition, classroom arrangement and sorting desks and benches in different forms of linear, circular, or small bunches can effect on diversity of educational spaces (Shabai, 2011). Classroom arrangement should facilitate the way of commuting for teacher and students in class. Classroom arrangement should facilitate interaction so that students at same grade can

negotiate with each other. The major part of program of an effective multi-grade class is organization of physical space of classroom to facilitate free commutation so that the classroom is suitable for various individual activities of students in small groups and whole of class (Unesco, 2013). Desks and benches are in a row in multi-grade classes due to lack of educational space and traditional attitude toward teaching so that students cannot see each other and interaction environment does not exist in such classes. Desks and benches can be arranged in form of semicircle or horseshoe if there is a large area in class; in this case, students can make face-to-face relationship and can cooperate with each other.

6- Classroom area: color, form, dimensions, area, and construction materials can be named as physical properties in school's spaces. Use of suitable dimensions for educational space should be considered to prepare the field for educational activities. Three factors of students' number, educational facilities and equipment, motional- behavioral privacies can effect on suitable functional space. In rural areas, 3 meters educational space is considered for each student (Iranian academic center for education, culture and research, 2008) and this measure has been selected as calculation base for classroom area. Desirable educational space will increase communications in class and positively effects on quality of interactions.

7- Auxiliary facilities: these facilities include cloth hanger, closet, book shelf, learning corner that is an area of class in which, students study individually or in groups, rest room for students. Students have some cloths or staffs such as coat, umbrella, hat, etc. that use them outside of the class and require to leave them in class and feel comfort (Unesco, 2013). Majority of students want to have private closet (Iranian academic center for education, culture and research, 2008) while such need has not taken into account in rural schools of Iran.

8 & 9- cooling and heating: classroom's temperature may affect health of students and unfavorable conditions may lead to indifference and stress (Azzi, Katrin & Roberto, 2007). Cooling and heating system depend on the type of climate; cold climate that is the largest climate group in Iran has made it necessary to use heating appliances I clod seasons in order to heat educational space in winter and spring while temperature of educational space is suitable in hot season even some months in fall and spring. Humid cold climate and moderate cold weather have same -as mentioned-thermal conditions during academic year. Educational spaces require cooling system in hot weather more than heating system in cold weather in a moderate hot climate (Organization for Renovating, Developing and Equipping Schools, 2007). Weather of prosperous and non-prosperous provinces in Iran makes people experience four seasons during a year. Hence, some parts of areas have very cold climate, some have humid and moderate cold climate while other parts have hot climate. Students should feel convenient in classroom and the classroom space should not be too much hot or cold (Mathot, 2001), because a significant part of \forall heating and cooling energy is wasted due to inappropriate conditions of roof, walls, door, and windows. Majority of multi-grade classes have low-quality window and metal non-standard doors while it has been recommended not using metal doors unless they are covered by a layer of plastic or wood; windows also should be made of aluminum (Organization for Renovating, Developing and Equipping Schools, 2007).

10- Computer: one computer or laptop is enough in class for various applications considering conditions of multi-grade classes and number of students. Computer can be used to save and calculate students' scores, to record presence or absences and

registration files, to assign homework or correct them. Moreover, computer can be used to access to education or promote education exchanging experiences and ideas (Mathot, 2001). The teacher can show instructional slides and films to students without using projector since there are few students in classroom. In this case, computer existence in class obtained score 2; laptop existence obtained score 1, instructional CDs and internet each obtained score 1. 11. Instructional materials: these materials include all facilities and equipment that make a more fast, simple, effective, and sustainable conditions for learning in educational space (Shabani, 2011). Instructional materials classified to 5 groups including prepared, hand-made, appliances, natural, and waste materials. Prepared instructional materials consist of those materials that are pre-prepared and exist in market. Hand-made materials include some tools prepared by teachers and students using available and waste materials considering the determined goals. Appliances are domestic tools existing in home of rural students. Use of any kind of mentioned instruments in classrooms will facilitate teaching-learning processes. Teaching-learning materials should be developed considering grouping and flexibility of grades. These materials can be used as supportive materials in class exposing them for all students. Some of these materials include books, play materials, specialized educational packages, story books, dictionaries (even encyclopedia), paper, pencil, crayons, oil color, colored markers, wallpaper or whiteboard, maps and models (Unesco, 2013); natural resources such as plants, reed, leaves, composite beads, etc.; animals such as oysters, animal skin and bones, minerals such as lime stone, coal, etc. that are available in local space freely (Mathot, 2001).

Question 2: How is the current situation of educational space of multi-grade classes in prosperous and non-prosperous provinces? As it is seen in table 2, educational space of multi-grade classes is different in a prosperous and nonprosperous provinces considering desirable condition since indicators are not similar in these provinces; however, some of indicators have minor differences. For instance, classroom spaces of two provinces are similar in terms of air conditioning and cooling system because of geographical and environmental situation of remote areas and villages that are far from air, soil, and water pollutants as well as light pollution; there are also similar in terms of cooling. Two prosperous and non-prosperous are at above-average level in terms of audio pacification and cooling system while non-prosperous province is at lower-average level with an undesirable condition in terms of color, classroom arrangement, area, auxiliary facilities, heating system, computer, and instructional materials while prosperous province is at above-average level with desirable circumstance in terms of other indicators. The mean of all indicators in prosperous province was above average and mean of all indicators in non-prosperous province was lower than average level. In addition, multi-grade classes in prosperous province had not much inappropriate condition in terms of indicators while color and light of these classes were inappropriate and other indicators were at average or above average level. According to the mentioned points, prosperous provinces had desirable situation generally. Circumstances of non-prosperous provinces indicate that some classes have very inappropriate conditions in terms of color, auxiliary facilities, and instructional materials; some other classes have inappropriate conditions in terms of audio pacification, ventilation, classroom arrangement, area, auxiliary facilities, heating, and computer; and some classes had appropriate conditions in terms of air ^

conditioning and light. These results indicated appropriate situation of non-prosperous province considering some of indicators.

Table 2. Current situation of education space of multi-grade classes in two prosperous and non-prosperous provinces considering the desirable situation

Row	Province Components	Prosperous province						Non-prosperous province									
		very appropriate	appropriate	average	inappropriate	very inappropriate	score	mean	very appropriate	appropriate	average	inappropriate	very inappropriate	score	mean		
1	color	30	20	6	4		60	4		12	15	8	3	38	2.5		
2	light	60	8		2		70	4.7	25	32		4		61	4		
3	audio pacification	30	28	6			64	4.2	20	32		4		56	3.7		
4	ventilation	55	16				71	4.7	50	8	6	2		66	4.4		
5	classroom arrangement		28	24			52	3.4		12	18	12		42	2.8		
6	area	35	4	18	2		59	3.9	5	12	24	6		47	3.1		
7	auxiliary facilities	20	12	15	6		53	3.5			15	14	3	32	2.1		
8	cooling		36	18			54	3.6		20	30			50	3.4		
9	heating	15	48				63	4.2		8	30	3		41	2.7		
10	computer	20	44				64	4.2				30		30	2		
11	instructional materials		52	4			56	3.7			18	8	5	31	2		
total sum and total mean							666	4	total sum and total mean							494	2.9

According to obtained results, prosperous province was desired in terms of color, light, audio pacification, air conditioning, heating, and computer (indicators 1, 2, 3, 4, 9, 10) and was at average level in terms of class arrangement, area, auxiliary facilities, cooling and instructional materials (indicators 5, 6, 7, 8, 11). Non-prosperous province had desirable conditions in terms of color and air conditioning (indicators 2 and 4), was at average level in terms of audio pacification, area, and cooling (indicators 3, 6, 8) and was at lower-average level in terms of color, classroom arrangement, auxiliary facilities, heating, computer, and instructional materials (indicators 1, 5, 7, 9, 10, 11).

Question 3: How is the current situation of educational space of multi-grade classes in viewpoint of teachers? Teachers in each province presented their ideas about indicators in their classes; viewpoint of one teacher and one student is mentioned herein. In other words, the viewpoint toward each indicator is presented in a way that indicates prevailing comment. 1-Color: “teacher 2 in prosperous province: our school is a two-story building with 8 classrooms that all of them were in used before; walls are covered by stone up to 1 meter, walls and ceiling of classes are brightly colored and students feel convenient in them”. “Teacher 3 in non-prosperous province: our class is not does not have a suitable space for teaching and learning. Our school does not have drinking place or WC. Walls are made of mud, the floor is cemented and roof is wooden”. “Student 1 in prosperous province: class is greatly colored with attractive and live colors. Walls are plastered and colored and this makes us happy”. “Student 2 in non-prosperous province: door and walls of class was colored before but now are black because of oil heater and when we enter the class the smell of oil is annoying”. As can be seen, teachers ¹ more pay attention to the effect of educational space so that the difference between multi-grade classes in two prosperous and non-prosperous provinces can be seen based on teachers’ viewpoint. 2-Light: teachers in two studied provinces commented in this case;

“teacher 5 in prosperous province: we have a large class with two large window and there is an empty space outside of the window; there are three lamps in classroom but there is no need to turn them on since we have enough natural light after 9.00. Therefore, students can simply see the blackboard and do their tasks in class without any problem”. “Teacher 2 in non-prosperous province: we have a rental classroom and we use it for a certain time and as you can see the owner has put his useless tools in side room; they immigrate to tropical lands for sheep grazing then are back here; so, we should find another place when they are back here. Our present classroom has a window with 1 meter in length and I had to put instructional books of teacher on the edge of the window so we cannot use enough light; there is only one lamp that is always on but still there is not enough light”. 3-Audio pacification: teachers commented on this case: “teacher 7 in prosperous province: although I send students to the yard or other classrooms, they still make noises and sometimes noise of animals and birds distracts us but we have gotten used to such noises”. “Teacher 3 in non-prosperous province: our school is far from the village; our school has a large yard that is covered by sand and when the weather is comfortable I send those students who are not the base for teaching and then teach others. I usually teach them individually and close the window to prevent form disturbing noises”. 4-Ventilation: teachers in each province commented on this case: “teacher 6 in prosperous province: our class has two large windows and one door and I open the door in hot weather and open windows per half an hour in cold weather because we have no ventilation system in class”. “Teacher 4 in non-prosperous province: since the class has window and its door is opened to the outside space, we have no problem for air conditioning. When it is required, I open the door and windows and when the weather is cold and oil heater is in work I open the door or windows a little to change the inside air”. 5-Classroom arrangement: teachers commented on this case: “teacher 6 in prosperous province: I teach 12 students in 4 grades and since we have a large area in class with a large yard with two extra classrooms, I teach students of a same grade in a separate classroom and others do their tasks in another classroom”. “Teacher 7 in non-prosperous classroom: our classroom is located in city margin; this is a 16-meter room that had been used for entrance to the company; there is no yard or another room so we cannot change the classroom arrangement and when some students in first or second grade have to go to their home. Desks and benches are clinging together and I have a fixed place”. 6-Area: “teacher 8 in prosperous province: we have a large school with large classrooms and I teach students in 5 grades. There is a large yard in school and have no problem in this case”. “Teacher 5 in non-prosperous province: I teach students in 3 grades in a classroom with suitable space. Students can simply commute in class but there is no yard in schools as our classroom is a rural rental house”. 7-Auxiliary facilities: teachers commented on this case: “teacher 1 in prosperous province: students put their shoes on the shoes box and use slippers when enter to the class. Students put their extra cloths such as coat, hat and umbrella on the cloth hanger. They can put extra books on the closet to have enough space on their table”. “Teacher 8 in non-prosperous province: as you can see, oil heater, extra closets, and other devices are placed in this class and it is really annoying for us. Students have to put their bags, books, coats, and hat on the desk and most of the time their personal items fall to the ground and distract all of us”. 8 and 9- cooling and heating: according to the viewpoint of teachers, “teacher 8 in

prosperous province: there is no gas pipeline in this area and we use electric radiator for heating and sometimes we have to use oil heater in cold weather. In hot weather we usually use no cooling system instead we sometime turn the fan on or open the window". "Teacher 4 in non-prosperous province: our classroom has just one room and since our classroom is located in the middle of road, those students who live upper side of the road come to this class. The place for classroom is rental, there is no gas pipeline, and we have to use oil heater. Heater is placed beside my chair to watch it not to fire. We open the window for cooling system as we have no fan or cooler". 10-computer: "teacher 7 in prosperous province: when it is required I take students to the room that has computer then teach them using slide or film; meanwhile, other students in different grades are doing their tasks". "Teacher 1 in non-prosperous province: we do not have computer or printer and sometime I have to show a short film to students on my cellphone". 11- Instructional tools: the importance of instructional tools has been mentioned by teachers; "Teacher 5 in prosperous province: we have some of instructional tools in school and when we need something that does not exist in the school then prepare it with the help of students and parents. Sometime I ask students bring some waste devices such as cans of food, bottle of mineral water, etc. to school based on health tips to create instructional tools helping students understand subjects". "Teacher 3 in non-prosperous province: we have no instructional tool; to remove this problem, ask for help of students and their parents. We use waste tools or some tools that exist in home of students. For instance, I asked a student to bring their fan to class to show the concept of motion; sometimes they bring some agricultural devices such as shovel and pick to facilitate learning process".

Discussion and Conclusion

Review of theoretical literature indicated that various authors and researchers have not paid attention to educational space of multi-grade classes when codifying components and indicators of educational space of classroom; they have more paid attention to mono-grade classes; hence, this study was conducted to use results obtained from conducted studies and interviews with experts in order to explain desirability components and indicators of educational spec of multi-grade classes using reasoning and extracted components and indicators in table 1 and 2. Summary of results is presented herein discussing each question: 1. Results obtained from this question 1 of study showed that desirable space of multi-grade classes should be compatible with existing standard for educational space of mono-grade classes in terms of color, light, audio pacification, ventilation, class arrangement, area, auxiliary facilities, cooling, heating, computer and instructional materials (table 1 & 2). According to Bakhtiar Nasrabadi (2001), Zamani and Nasr (2007), Darmody and Smyth (2010), and Unesco (2013), lack of attention to each of mentioned indicators in agriculture of classroom have irreversible effects on productivity of teacher and students. 2. Results obtained form question 2 of study indicated that prosperous province was desired in terms of color, light, audio pacification, air conditioning, heating, and computer (indicators 1, 2, 3, 4, 9, 10) and was at average level in terms of class arrangement, area, auxiliary facilities, cooling and instructional materials (indicators 5, 6, 7, 8). Non-prosperous province had desirable conditions in terms of light and air conditioning (indicators 1 and 4), was at average level in terms of audio pacification, area, and cooling (indicators 3, 6, 8)

and was at lower-average level in terms of color, classroom arrangement, auxiliary facilities, heating, computer, and instructional materials (indicators 1, 5, 7, 9, 10, 11). These classes had desirable situation in terms of light, ventilation, and audio pacification because of their physical situation in two prosperous and non-prosperous provinces, because these classes are usually located in remote areas and their surrounding environment is close to mountain, plain, desert, and agricultural lands so that teachers and students can use suitable light and ventilation opening the window. Enough light in class is necessary condition to participated in teaching-learning processes while lack of enough light may disturb education and training process; suitable lightening of classroom can be provided naturally and artificially. It would be better if educational spaces have suitable connection to outside space through windows in order to provide mental health of children. On the other hand, suitable air condition of class leads to physical and mental comfort of students so they do not feel fatigue and teacher teach them more energetically. Therefore, proper ventilation of classroom is essential to prevent from students' exhaustion. In addition, multi-grade classes do not have sound pollution like mono-grade classes because majority of external sounds belong to animals and birds and such sounds are pleasant but they sometimes distract the class's concentration; this subject has not been covered by the scope of this research. Internal sounds of class were examined in this study. Internal sounds distract students more compared to external sounds. Teaching to one grade while there are other students with different grades besides various activities disturb audio pacification of teacher and students. Educational spaces of multi-grade classes in two prosperous and non-prosperous provinces were different in terms of other indicators. The space of multi-grade classes in prosperous province was appropriate in terms of all indicators while the space of multi-grade classes in nonprosperous province was inappropriate in terms of color, classroom arrangement, area, auxiliary facilities, computer, instructional materials, cooling and heating systems. Researcher's observations showed that these results cannot be generalized to all classes in studied provinces. A small number of multi-grade classes in prosperous province had inappropriate conditions in terms of some indicators; in contrary, a small number of classes had appropriate condition in non-prosperous province. 3. Answering to question 3 of study, it was indicated that teachers had different viewpoints toward educational space of their provinces considering current situation of indicators; in other words, every teacher commented on this case based on his/her own awareness level about current situation of educational space of these classes. Teachers in prosperous province were satisfied with existing situation of educational space because of having facilities and relative observation of criteria and principles related to educational space. In this field, Thames (2002) mentioned the correlation between higher qualities of building, better lightening, thermal comfort, air quality, access to laboratories and libraries, and students' achievement. These results show that the higher the quality of educational space, the higher the efficiency and productivity of teacher will obtain. In contrary, teachers of non-prosperous province were not satisfied with current situation of educational space of their classes, because current situation of educational space in their classes was lower than average level. These results are in line with results obtained by Molaee (1995), Navidadham (1996), Daneshmehr (1998), Tabian, Habib and Abedi (2011), Farahbod and Gharib (2014). Researcher's observations

confirmed comments presented by teachers in two prosperous and non-prosperous provinces.

Applied Suggestions

1. Educational and training organization in province with multi-grade classes should investigate educational space of these classes to remove their shortcomings in order to create more desirable learning processes. 2. Considering the large number of multi-grade classes and increasing number of them as it is anticipated for future, it is recommended strengthening the organizational structure related to these classes at ministry level and in all provincial education and training centers so that they can take more suitable measures based on components and indicators of educational space contained in tables 1 and 2. 3. There should be an instant action to renovate multi-grade classes in two provinces in terms of educational space classifying them at three good, average, and weak levels considering financial and executive facilities in order to create a desirable educational space gradually. 4. A specific budget should be anticipated for multi-grade classes in non-prosperous provinces, in particular for educational space costs doing some corrective actions. 5. Conditions and properties of multi-grade classes should be taken into account as priorities of Educational and Training Ministry as well as provincial education and training centers. 6. The methodology of this study can be used in further studies to examine other elements of multi-grade classes in different provinces. It should be noted that results obtained from this study are related to one prosperous province and one non-prosperous province; hence, these results should not be generalized to other provinces. Therefore, other provinces can be studied in further studies. In addition, desirable components and indicators of educational space of multi-grade classes have not been validated due to limited number of experts in this field; hence, it is recommended repeating and completing such process in other provinces in order to validate component and indicators of educational space of multi-grade classes.

Disclosure statement

No potential conflict of interest was reported by the authors.

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