Original Research

Information Literacy Learning Environment of Primary Schools in Iran: An Exploratory Study

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Abstract

This study aims to identify the characteristics of the information literacy learning environment (ILLE) for primary school students in Iran. This research was done by qualitative method and using content analysis. The statistical population was divided into two parts: 1) literature related to the INTE and 2) experts in the field of Information Literacy (IL). A researcher-made checklist was used to collect information in the first part, which was exploratory. The data collection tool from the second part of the community was the Delphi panel questionnaire, which was implemented in two stages. The results showed that ILLE has four dimensions for primary school students in Iran: educator, school library, classroom space, and educational resources. Considering these dimensions, categories, and sub-categories, it can be expected that a suitable environment will be provided for implementing IL programs in primary schools in Iran. Training administrators, curriculum developers, and information literacy educators can use this study's findings to improve ILLE to develop students with information literacy skills. This study is the first comprehensive study conducted in Iran that sought to identify the ILLE for primary school students. The findings are useful in providing a suitable environment for IL within schools in Iran and other countries.

Introduction

The nature of the information age and its effects have transformed the concept of literacy. Since the 21st century is the age of information and communication, information users need a deep understanding of how to receive, evaluate, and apply this information and skills. At this time, the way of obtaining information has gone out of the traditional mode and entered new fields, and without a doubt, the first step in entering this field is the use of information literacy. The concept of IL has been evolving. The simplest definition of literacy is the skills individuals

need to play their role in society, such as reading, writing, and understanding their language (Bawden 2001). There are various definitions and interpretations of IL. Compared to literacy, the ability to understand the written message and convey the message in writing, IL can obtain and use information in any form and format, both print and electronic (Fazeli Dehkordi, 2011). The Association of College & Research Libraries (2016) defines IL as a "set of integrated abilities encompassing the reflective discovery of information, the understanding of how information is produced and valued and the use of information in creating new knowledge and participating ethically in communities of learning".

IL was introduced in the late 1980s, and many programs were developed to integrate IL into the curriculum. Also, teaching IL to learners involves teaching library or bibliography or mastering the use of various information resources and teaching critical and analytical thinking skills. IL training is the key to fostering learners who will work as independent and lifelong learners in society (Baji, Bigdeli, Parsa & Haeusler, 2018). Given that IL facilitates learning in educational settings and educational systems are also influenced by the development of information technology, students with IL skills can use their individual and social abilities best of others.

The education system must teach "how to learn." In this process, the possibility of combining what is learned and creating knowledge emerges. Without these infrastructures, everything learned will remain without integration and not lead to insight and culture.

To teach IL to children, it is necessary to provide appropriate conditions and contexts for it and the infrastructure. The right training environment provides the basis for the practical implementation of these trainings. The educational environment includes formal methods, teaching, lesson objectives, homework, teaching quality, flexibility in learning to learners, and social atmosphere (Entwistle, 1981). This environment for teaching IL, in addition to the above, also includes a library (school or classroom library).

A review of the research background in this field shows that although significant studies have been conducted, the characteristics of a suitable environment for teaching IL to students, especially in primary school, are still lacking. Therefore, the issue of the present study was to address this shortcoming in the field of IL. The results of this study are expected to help education authorities, and policymakers plan to create a suitable environment for teaching IL to children. Another benefit of this study includes those (such as teachers and librarians) who, in the form of educators, oversee teaching IL to students of this level and, despite the appropriate environment, can achieve the educational goals of IL. The final benefit of the present study is that it is performed for its main audience, i.e., students, who, along with other suitable contexts for teaching IL, have an appropriate environment to achieve the practical possibility of its realization.

Research questions
1. What features are considered for the ILLE for children in the literature?
2. According to IL professionals and researchers in the field of children, what are the characteristics of a suitable environment for teaching IL?

Literature review
Information literacy education for children has been studied from different aspects. The research can be divided into three categories: frameworks for IL, teaching and teachers, and

school library and librarian. Most of the IL literature in education is focused on academic and higher education rather than school level. Literature also showed less emphasis at primary school.

Frameworks for IL at the school level

The main research in this regard is IL standards proposed by the American Association of School Librarians in 1994, the Big6 model of Eisenberg (Eisenberg & Berkowitz, 2000), and Herring's PLUS model (Herring, 2012) in the 1990s (Markless & Streatfield, 2007). The AASL model exhorted collaboration between teachers and specialists, library media centers, and specialists to teach IL in the school curriculum. The Big6 model focused on task definition, information-seeking strategies, location and access, use of information, synthesis, and evaluation. Hering's model has a sociocultural approach emphasizing students and teacher-librarians. There are some lesser-known but more valuable models, such as Webber and Johnston (2000), Willison and Regan (2005), Kong (2007), and Batool and Webber (2019), which can be used to evaluate IL at the school level.

Teaching the teachers

Some studies have addressed the role of teachers in teaching information literacy. For example, Wu, Zhou, Li & Chen (2022) study addressed the teachers' competence to develop students' information literacy (TCDSIL and surveyed 9909 teachers in 1286 primary and secondary schools. Results indicated that teacher characteristics and school context are significantly related to TCDSIL. Among school-related factors, school type, resources for instruction, and network bandwidth have positively significant relationships with TCDSIL. Moreover, teachers' perceived usefulness, information processing skills (the skills of information access, information usage, and information management), and information ethics could predict TCDSIL. Bineshian, Zerehsaz and Mohammadhasani (2020) investigated the role of IL in using different teaching methods among primary school teachers. The results indicated that the teachers with IL skills use different approaches in their teaching process. Therefore, IL skills can be more effective in choosing and improving diverse teaching styles. There is an inverse relationship between direct teaching style and IL and a direct relationship between indirect, problem-oriented, and interactive teaching styles and IL.

In their study, Ben Amram, Aharony and Bar Ilan (2021) focused on teachers' perspectives concerning IL teaching in two primary schools in Israel- one school that joined the national information and communications technology program and a second school that did not. The researchers used a qualitative research method during the 2015 academic year. The findings showed that participation in the national information and communications technology program did not lead to the integration of IL into the school's curriculum. A significant gap was discovered in both schools between the teachers' perceptions of the importance of teaching IL and its implementation. Lamount (2021) did research to gain insight into how Scottish secondary teachers conduct their continuous professional development and to explore their understanding of and engagement with IL through a qualitative methods approach. Results showed that although teachers were unfamiliar with IL, they understood the fundamental skills associated with it and recognized its significance for education and general life skills. They were confident in their own IL abilities but considered there to be no professional development support available to them.

School library and librarian

Some researchers have focused on school libraries and librarians in their studies. Drivenes Moore and Trysnes, (2021) investigated how children can develop IL skills before learning to read and write. The researchers used a combination of participatory observation and action research-inspired trialing of digital tools. Kindergarteners were given iPads and access to Book Creator's app to create digital stories. The electronic books were gathered and made available to the other children in the class, making a custom local digital library for the kindergarten. Parisi-Moreno, Llonch-Molina, and Selfa (2021) conducted a study emphasizing the role of school museums in teaching Il. Based on the use of primary sources, these researchers propose the school museum's interdisciplinary approach as an alternative to the school library. This inquiry has implications for teacher effectiveness, student-centered learning, reading motivation, and the school-community relationship. Finally, we give some recommendations concerning school museum implementation and further research on school museums.

In another study, Barát (2016) presented an education methodology for a student aiming to become a teacher of library pedagogy in Hungary. Summarize the results of the first years when library pedagogy courses were introduced, their curricula, division of subjects, experiences of practical teaching, and portfolio of completion methods. These courses aim to broaden library pedagogy to enable students to develop the information literacy of children in schools and public libraries. Lo et al. (2014) examine and compare the roles of school librarians as Il instructors in Hong Kong, Japan, Shanghai, Taipei and South Korea. The results showed that school librarians outperformed the other regions in Taipei and South Korea regarding the scope and extent of duties these school librarians undertook as IL skill instructors.

In conclusion, the literature shows that although many studies have been conducted on teaching and learning information literacy to children, there is still a gap in research on the ILLE and its elements. Therefore, by addressing the first part of this shortcoming, the present study sought to identify the characteristics of ILLE to offer these criteria as a basis for designing a suitable environment in Iranian primary schools.

Materials and methods

The study was conducted with a qualitative research approach and qualitative content analysis method. The present study population consisted of two parts: 1) texts related to ILLE: In this section, internal and external texts and researches about suitable education and learning environment for children and texts of IL were identified and reviewed. This exploratory part of the study aimed to identify the criteria for an appropriate setting for teaching and learning IL. 2) Specialists in information science and epistemology in the field of IL. This section of the community consisted of ten experts in the field of IL in Iran. Sampling of this community was done by snowball method. The purpose of studying this part of society was to collect the views of experts about the appropriate environment for teaching and learning IL to primary school students.

Two tools were used to collect data and information in this study, separately from the two sections;

1- Checklist as a tool related to the first part of society (texts related to the ILLE). The design of this list was done in two steps:

 - In the first stage, texts related to IL in training and learning, both foreign and domestic

texts were reviewed and analyzed. After initial monitoring of the texts, four dimensions were identified for IL teaching and learning environment characteristics.

- In the second stage, by analyzing the qualitative content of the texts in a deductive way, the main and sub-categories related to each dimension were identified.

2- Questionnaire to implement the Delphi panel as a tool for the second part of the community (IL professionals). The reason for choosing the Delphi method in this part of the research was to receive experts' opinions about the characteristics of the IL learning environment. This was sent to people in the field of IL who were experts, experienced, and instructors. After that, the obtained questionnaire was given to the members of the Delphi panel. The number of these people was 10 in the first round and 7 in the second round (because they did not receive any answer from three people, they had to continue the research with seven people in the second round). For ease of work, respondents were asked to express their views on the importance of each dimension, the main category, and related categories based on the Likert scale (from 1 to 10).

The process was such that the questionnaire was provided to the members of the Delphi group to identify the most critical dimensions and the main categories related to them from the perspective of experts. In this way, they were asked to express their views on the importance of each of the main dimensions and categories of the IL education and learning environment. The main criteria that averaged more than 7.5 remained on the list, and the rest were left out. In the second round of Delphi, a new edition of the questionnaire was sent to the members along with the changes made in the initial edition and the addition of sub-categories to express their views on approving or rejecting the changes along with their proposed opinion on each sub-category. Sub-criteria that averaged more than 7.5 remained on the list, and the rest were left out. The output of this step was used to answer the second question of the research.

4 professors and experts in IL will consult you to review the checklist. The researcher-made version of the questionnaire was provided to these people to run the Delphi panel, and after receiving comments, some items were removed from each section, and some were added. Finally, after making the necessary corrections, the final questionnaire was prepared for the first round of Delphi. Because the Delphi questionnaire was designed based on a checklist whose validity had previously been confirmed by experts, the validity was not assessed for this tool.

Results

Findings from the review of texts related to the ILLE showed four main dimensions: educator, school library, classroom space, and educational resources. The characteristics of each dimension are given in Tables 1 to 4.

Analysis of the literature showed that at least 6 main categories (Table 1) can be considered for IL educators. The first category is *the ability to define and express information needs*. This category shows that there is a need for educators who have the educational skills needed to teach in educational settings and can tell the information needs of students. The second category is *the ability to select and locate the source of information;* in this category, the teacher must be careful in using the place of information obtained for training and the tool they choose to provide it. The third category is *the ability to organize and analyze information*. This category indicates that the teacher should be able to organize and analyze the information obtained and

present it to students simply and fluently. The fourth category is *combining, processing, and presenting searched information*. This shows that the teachers must be able to combine their previous information with new information, process it, and consider how to present it. Another category is *the ability to evaluate the individual information retrieval process*. This category suggests that the teacher should consider an appropriate process for presenting the material obtained. The sixth category is *the ability to apply ethical principles in scientific activities*. This category aims to teach copyright and ethical principles in presenting the content.

Table 1
Educator Characteristics for ILLE Based on Literature

Dimension	Main categories	Sub categories
		Ability to:
Educator	1.1- Define and express information needs	1-1-1. Identify information needs 1-1-2. Express information needs 1-1-3. Choose the right tool to find information 1-1-4. Choose the right strategy to search for the information needed 1-1-5. Identify required information 1-1-6. Review public information sources to become familiar with the scope of information needs
	1.2- Select and locate information sources	1-2-1. Locate required information 1-2-2. Select the appropriate search tool
	1.3- Organize and analyze information	1-3-1. Organize information 1-3-2. Analyze information
	1.4- Combine, process and provide searched information	1-4-1. Process information 1-4-2. Combine information 1-4-3. Provide information
	1.5- Evaluate the individual information retrieval process	1-5-1. Evaluate individual pieces of information 1-5-2. Evaluate the information retrieval process
	1.6- Apply ethical principles in scientific activities	1-6-1. Use information ethically 1-6-2. Comply with copyright laws 1-6-3. Publish information ethically

In the study of IL texts for the school libraries dimension, nine main categories were extracted, which are discussed below (Table 2):

The first category is the *educational and research role of the library in supporting the curriculum*. In this section, libraries should nurture students interested in reading, a critical, creative initiative, and a better understanding of educational concepts. The second category is *the management of the library by the librarian*. This category emphasizes the need for the school librarian to manage the school library. The third category is *the ease of access to the library for immediate reference if needed*, which indicates that the school library should be where students can access their information needs more quickly. Some training classes can be held there. The fourth category is the *use of support staff as expert librarian support staff*. In this section, support staff should assist the librarian in specializing in executing library work and ceremonies and organizing and collecting complementary librarian resources. The fifth category is the *library, the main center for maintaining and accessing the information resources*

students need. This category shows that school libraries should provide the information resources students need, be diligent in maintaining it, and be able to provide these resources with the necessary ability and skills. The next category is the *library as an active learning center for students.* This indicates that students can achieve critical thinking, worldview, and problem-solving by studying in the library and how to use information resources. The eighth category emphasizes *the role of librarian counseling alongside the teacher.* This means that the librarian can assist the teaching team, parents, planners, teachers, and students when they need information resources and advice to select the resources they need. The ninth category, *the library's variety of facilities and services and their attractiveness affect education and learning*. In this section, the librarian, as a leader, should be able to provide students and teachers with interpersonal connections and problem-solving skills with high diversity and attractiveness. Of course, the role of librarians and their way of working in information literacy training must change (Frederick, 2021).

Table 2
School Library Characteristics for ILLE Based on Literature

Dimension	Main categories	Sub categories
School library	2.1- The educational and research role of the library in supporting the curricula	2-1-1. Help increase interest in reading 2-1-2. Help develop critical thinking 2-1-3. Help expand the concept of education 2-1-4. Provide education to parents 2-1-5. Giving ground for students' creativity 2-1-6. Improving students' individual abilities and social understanding
	2.2- Library management by a librarian in a scientific and professional manner	2-2-1. Graduated in librarianship 2-2-2. Mastery of IL skills 2-2-3. Mastery of management skills 2-2-4. Provider of resources 2-2-5. Resource organizer 2-2-6. Public service provider 2-2-7. Seeker of information resources 2-2-8. Evaluator of information resources 2-2-9. Library policy editor 2-2-10. Collaborate with teachers and students
	2.3- Ease of access to the library for immediate reference if needed	2-3-1. Specified service hours 2-3-2. Availability during school activities 2-3-3. Accessibility for parents and graduate students 2-3-4. Holding some classes in the library
	2.4- Using support staff as an expert librarian support staff	2-4-1. Playing the complementary role of librarian 2-4-2. Assistance in collection development 2-4-3. Assistance in organization 2-4-4. Advice on resource selection 2-4-5. Assist in holding Q&A sessions and running programs 2-4-6. Background in librarianship
	2.5- Library as the main center for maintaining	2-5-1. Data bases 2-5-2. References Bibliographies, indexes, abstracts

Dimension	Main categories	Sub categories
	and accessing the information resources needed by students	2-5-3. Audio-visual resources 2-5-4. A variety of scientific resources and educational assistance 2-5-5. Journals and magazines 2-5-6. Multimedia materials (such as movies, slides, etc.)
	2.6- Library as an active learning center for students	2-6-1. Develop imagination and lifelong learning 2-6-2. Problem Research and Diagnosis Center 2-6-3. Teach how to use information resources 2-6-4. Expanding students' critical vision, mental horizon, and worldview
	2.7- The professional role of the librarian in helping to teach the lessons	2-7-1. Help students to find information resources 2-7-2. Prepare and provide the required educational information to the teacher 2-7-3. Manage online and offline media
	2.8- Librarian's advisory role	2-8-1. Assist the school's teaching team 2-8-2. Advice on using the media in connection with the lessons 2-8-3. Help design educational lessons 2-8-4. Student counselor in relation to information resources 2-8-5. Teacher Advisor in relation to information resources 2-8-6. Parent counselor regarding information resources 2-8-7. Membership in the Teachers' Council
	2.9- Variety of library facilities and services and their attractiveness affecting education and learning	2-9-1. Playing the role of leadership and management 2-9-2. Personality efficiency 2-9-3. Interpersonal relationships 2-9-4. Having problem solving skills

The first category in Classroom characteristics is the *number of information sources*. This section considers the teaching, non-teaching, and visual and audio resources that should be used. The second category is *educational standards*. This category means observing the standard and ensuring the quality of tools and equipment needed for training and should be provided to the teacher. The third category is *appropriate equipment* for teaching information literacy. This category indicates that the space used for teaching should be equipped with items that the learner can use to meet their information needs. The fourth category, *educational space*, is one of the influential factors in educating students (Table 3). And the space must be alive and dynamic so that the student can flourish his creativity and talents.

Table 3
Classroom Characteristics for ILLE Based on Literature

Dimension	Main categories	Sub categories
Classroom space	3.1- Number of information sources	3-1-1. Number of teaching resources 3-1-2. Number of extracurricular resources

Dimension	Main categories	Sub categories
		3-1-3. Number of audio-visual sources
	3.2- Educational standards	3-2-1. Laboratory tools and equipment
		3-2-2. A library shelf or cupboard
		3-2-3. Bulletin
	3.3- Appropriate equipment	3-3-1. Equipped with computer
		3-3-2. Equipped with video projector
		3-3-3. Equipped with smart boards
		3-3-4. Equipped with high speed internet
	3.4- Educational space	3-4-1. Classroom status
		3-4-2. Teaching method
		3-4-3. Avoid internal and external noise
		3-4-4. Color
		3-4-5. Ventilation and temperature
		3-4-6. Creativity
		3-4-7. Playfulness
		3-4-8. flexibility

The first category in the educational resources is *Curriculum resources.* It means what is taught to students in the classroom, the issues and exercises that the teacher presents, and the content of the textbooks taught to students. The second category is *Curriculum support resources.* This category refers to textbooks or any other teaching aids that the student can use to complete their information needs in the curriculum (Table 4).

Table 4
Educational Resources Characteristics for ILLE Based on Literature

Dimension	Main categories	Subcategories
Educational resources	4.1- Curriculum resources	4-1-1. Research-oriented content
		4-1-2. Content design tailored to the content
		4-1-3. Practical practice for lessons
		4-1-4. Problem-oriented content
		4-1-5. Multimedia content
		4-1-6. Use innovative methods in presenting content
	4.2- Curriculum support resources	4-2-1. Educational help book
		4-2-2. Textbook related content
		4-2-3. Electronic content
		4-2-4. Educational software
		4-2-5. Audio visual resources
		4-2-6. Dynamic display in content
		4-2-7. Periodicals
		4-2-8. Fiction, science, fiction, literary and religious books

The first question of the research can be answered based on the findings whose analysis is shown in the previous tables. The findings of this study showed that in the IL literature, at least four dimensions, 21 main, and 100 sub-categories are considered as the characteristics of ILLE. It may not be possible to provide all of them. In particular, some are more emphasized in non-Persian texts and may be less relevant to IL training in Iran. For this reason, in two rounds,

these findings were provided to experts through a Delphi questionnaire to comment on their importance. Their proposed deletion, addition, or change in the categories related to each dimension are given in Tables 5 and 6.

Table5
Expert Opinion in the First Round of Delphi About the Characteristics of the ILLE To Primary School Students in Iran

Dimension	Average opinion of experts	Main Category	Expert scores based on importance										Average opinion of experts
			10	9	8	7	6	5	4	3	2	1	
1. Educator	7.9	1.1- Define and express information needs	7	9	7	9	7	9	10	10	3	9	8
		1.2- Select and locate information sources	7	9	8	7	8	9	9	10	3	9	7.9
		1.3- Organize and analyze information	7	10	8	8	7	9	9	10	3	10	8.1
		1.4- Combine, process, and provide searched information	8	9	8	7	8	9	9	10	3	10	8.1
		1.5- Evaluate the individual information retrieval process	8	8	6	8	8	9	8	10	3	10	7.8
		1.6- Apply ethical principles in scientific activities	9	9	8	9	9	9	10	10	3	10	8.6
2. School library	8.8	2.1- The educational and research role of the library in supporting the curricula	9	9	9	7	9	9	7	10	10	7	8.6
		2.2- Library management by a librarian in a scientific and professional manner	10	8	9	9	10	9	9	7	9	9	8.9
		2.3- Ease of access to the library for immediate reference if needed	10	9	8	9	10	9	10	10	9	5	8.9
		2.4- Using support staff as an expert librarian support staff	9	8	8	8	9	9	9	10	9	7	8.6
		2.5- Library as the main center for maintaining and accessing the information resources needed by students	10	10	8	8	10	9	10	10	10	5	8/9

Dimension	Average opinion of experts	Main Category	Expert scores based on importance										Average opinion of experts
			10	9	8	7	6	5	4	3	2	1	
		2.6- Library as an active learning center for students	10	8	8	7	10	9	10	10	10	8	8.9
		2.7- The professional role of the librarian in helping to teach the lessons	9	8	8	8	9	9	9	9	10	6	8.5
		2.8- Librarian's advisory role	8	8	9	8	8	9	10	10	10	8	8.8
		2.9- Librarian as library manager	10	1	8	9	10	9	9	1	9	10	7.6
3. Classroom space	7.6	3.1- Number of information sources	7	9	8	10	7	9	8	8	2	6	7.4
		3.2- Educational standards	8	10	7	9	8	9	8	10	1	9	7.9
		3.3- Appropriate equipment	8	10	8	9	8	9	8	10	8	8	8.6
		3.4- Educational space	8	10	7	8	8	9	9	8	7	8	8.2
4. Educational resources	8.6	4.1- Curriculum resources	8	9	7	8	8	9	10	0	5	7	7.1
		4.2- non-curricular resources	9	10	8	10	9	9	10	0	9	8	8.2

Based on Table 5, according to IL experts, the most significant changes are:

1- "School libraries" are the most important (8.8). In this dimension, the two main categories, "Library as the main center for maintaining and accessing information resources needed by students" and "Library as the center of active student learning" (both 8.9) have the most significant importance.

2- "Educational resources" was recognized as the second dimension of importance (8.6). The main category of "teaching resources" (7.1) was removed in this dimension.

3- Experts evaluated " Educator " as the third critical dimension (7.9). In this dimension, "ability to apply ethical principles in scientific activities" (8.6) was recognized as the most critical category.

4- "Classroom space" was considered the least important by other experts compared to different dimensions (7.6), and the main category of "number of information resources" was removed from that (7.7).

Thus, in the first round of Delphi, two main categories (curriculum resources in terms of educational resources and number of information resources in terms of classroom space) were eliminated. Some main categories were added to the four dimensions at the experts' suggestion in this section. The results of these changes are shown in Table 6.

Table 6
The Final Results of the First Round of Delphi on the Main Categories of the IL Learning Environment

Dimensions	Main categories
1. Educator	1.1- Ability to define and express information needs
	1.2- Ability to select and locate information sources
	1.3- Ability to organize and analyze information
	1.4- Ability to combine, process, and provide searched information
	1.5- Ability to evaluate the individual information retrieval process
	1.6- Ability to apply ethical principles in scientific activities
2. School Library	2.1- The educational and research role of the library in supporting the curricula
	2.2- Library management by a librarian in a scientific and professional manner
	2.3- Ease of access to the library for immediate reference if needed
	2.4- Using support staff as an expert librarian support staff
	2.5- Library as the main center for maintaining and accessing the information resources needed by students
	2.6- Library as an active learning center for students
	2.7- The professional role of the librarian in helping to teach the lessons
	2.8- The advisor role of the librarian next to the teacher
	2.9- Variety of facilities and services of the library and their attractiveness, affecting education and learning
3. Classroom space	3.1- Educational standards
	3.2- Appropriate equipment
	3.3- Educational space
4. Educational resources	4.1- Curriculum support resources

Table 6 shows the changes considered by experts in the main categories. These changes include:

- In the dimension of the school library, the main category of "the educational role of the library in supporting the curriculum" was changed to "the educational and research role of the library in supporting the curriculum". Later, "library management by a librarian" was changed to "library management by a librarian scientifically and professionally".

- In the second dimension, the ninth category changed from "librarian in the role of library manager" to "variety of library facilities and services and their attractiveness, affecting education and learning".

- Regarding educational resources, the main category of "non-curricular resources" was changed to "curriculum support resources".

These changes were added to the second round of the Delphi panel questionnaire and made available to experts. The results are shown in Table 7.

Table 7
Expert Opinion in the Second Round of Delphi About the Characteristics of the ILLE to Primary School Students in Iran

Dimension	Main Category	Subcategories	Average opinion of experts
1. Educator	1.1- Ability to define and express information needs	1-1-1. Ability to identify information needs	8.9
		1-1-2. Ability to express information needs	9.1
		1-1-3. Ability to choose the right tool to find information	8.9
		1-1-4. Ability to choose the right strategy to search for the information needed	8.3
		1-1-5. Ability to identify required information	8.9
		1-1-6. Ability to review public information sources to become familiar with the scope of information needs	8.3
	1.2- Ability to select and locate information sources	1-2-1. Ability to locate required information	8.9
		1-2-2. Ability to select the appropriate search tool	8.7
	1.3- Ability to organize and analyze information	1-3-1. Ability to organize information	8.1
		1-3-2. Ability to analyze information	8.7
	1.4- Ability to combine, process and provide searched information	1-4-1. Ability to process information	8.6
		1-4-2. Ability to combine information	8.4
		1-4-3. Ability to provide information	9
	1.5- Ability to evaluate the individual information retrieval process	1-5-1. Ability to evaluate individual pieces of information	8.4
		1-5-2. Ability to evaluate the information retrieval process	8.1
	1.6- Ability to apply ethical principles in scientific activities	1-6-1. Ability to use information ethically	9
		1-6-2. Ability to comply with copyright laws	8.9
		1-6-3. Ability to publish information ethically	8.7
2. School library	2.1- The educational and research role of the library in supporting the curricula	2-1-1. Help increase interest in reading	9
		2-1-2. Contribute to the development of critical thinking and attitude	8.4
		2-1-3. Help expand the concept of education	8.3
		2-1-4. Provide education to parents	7.7
		2-1-5. Underpinning students' creativity and initiative	8.6
	2.2- Library management by a librarian in a scientific and professional	2-2-1. Holds a degree in information science and science	9.1
		2-2-2. Has IL skills	9.3
		2-2-3. Has managerial skills	8.3

Dimension	Main Category	Subcategories	Average opinion of experts
	manner	2-2-4. Provider of resources	7.6
		2-2-5. Resource organizer	8
		2-2-6. Public service provider	7.9
		2-2-7. Seeker of information resources	8.9
		2-2-8. Evaluator of information resources	9.3
		2-2-9. Library Policy Editor	8.6
		2-2-10. Collaborate with teachers and students	9
	2.3- Ease of access to the library for immediate reference if needed	2-3-1. Specified service hours	8.6
		2-3-2. Availability during school activities	8.6
		2-3-3. Accessibility for parents and graduate students	9
		2-3-4. Holding some classes in the library	8.7
		2-3-5- Possibility of virtual access to library resources	9
	2.4- Using support staff as an expert librarian support staff	2-4-1. Playing the complementary role of librarian	7.3
		2-4-2. Assistance in collection	8.7
		2-4-3. Help organize resources	8.3
		2-4-4. Advice on resource selection	8.9
		2-4-5. Assist in holding Q&A sessions and running programs	8.7
		2-4-6. Passing librarianship courses	7.3
	2.5- Library as the main center for maintaining and accessing the information resources needed by students	2-5-1. Data bases	8.4
		2-5-2. References Bibliographies, indexes, abstracts	7.6
		2-5-3. Visual and audio sources	8.4
		2-5-4. A variety of scientific resources and educational assistance	8.4
		2-5-5. General and specialized magazines	8.1
		2-5-6. Multimedia materials such as movies, slides, etc.	8.7
		2-5-7- Electronic and digital resources	8.7
	2.6- Library as an active learning center for students	2-6-1. Develop imagination and lifelong learning	9
		2-6-2. Problem Research and Diagnosis Center	8.9
		2-6-3. Teach how to use information resources	9.1
		2-6-4. Expanding students' critical vision, mental horizon, and worldview	8.4
	2.7- The professional role of the librarian in helping to teach the lessons	2-7-1. Help students search for resources	8.9
		2-7-2. Prepare and provide the required educational information to the teacher	8.9
		2-7-3. Manage online and offline media	9

Dimension	Main Category	Subcategories	Average opinion of experts
	2.8- The advisor role of the librarian next to the teacher	2-8-1. Assist the school's teaching team	8.1
		2-8-2. Advice on the use of media in connection with the lessons	8
			8.4
		2-8-3. Help design educational lessons	8.4
		2-8-4. Student counselor concerning information resources	8.9
		2-8-5. Teacher advisor concerning information resources	8.9
		2-8-6. Parent counselor regarding information resources	9
		2-8-7. Membership in the Board of Secretaries	9
	2.9- Variety of facilities and services of the library and their attractiveness, affecting education and learning	2-9-1. Playing the role of leadership and management	7.9
		2-9-2. Personality efficiency	8
		2-9-3. Interpersonal relationships	9
		2-9-4. Having problem-solving skills	8.9
3. Classroom space	3.1- Educational standards	3-2-1. Laboratory tools and equipment	8
		3-2-2. A library shelf or cupboard	8.6
		3-2-3. Bulletin	8
	3.2- Appropriate equipment	3-3-1. Equipped with computer	9.3
		3-3-2. Equipped with a video projector	9
		3-3-3. Equipped with smart boards	8.4
		3-3-4. Equipped with high-speed internet	9.4
	3.3- Educational space	3-4-1. Classroom status	8.7
		3-4-2. Avoid internal and external noise	9.4
		3-4-3. Color	8.9
		3-4-4. Ventilation and temperature	9
		3-4-5. Creativity	8.9
		3-4-6. Playfulness	9
		3-4-7. flexibility	9
4. Educational resources	4.1- Curriculum support resources	4-2-1. Educational help book	7.9
		4-2-2. Textbook related content	8.3
		4-2-3. Provide content electronically	8.9
		4-2-4. Educational software	9
		4-2-5. Visual and audio sources	9
		4-2-6. Dynamic display in content	8.9
		4-2-7. Periodicals	8
		4-2-8. Fiction, science, fiction, literary and religious books	9.1

By reviewing the opinions and scores of experts for each sub-category and the average obtained according to Table 7, these are the most essential points:

- In the first dimension, in the main category of "ability to define and express information needs", the sub-category of "ability to express information needs" with an average of (9.1) gained the most importance from the point of view of experts.

- In the dimension of school libraries, in the main category of "library management by a librarian scientifically and professionally", the sub-category of "having IL skills" and "evaluation of information resources" both with an average of (9.3) gained the most importance. Also, in the main category of "using support staff as an expert librarian support staff", the two sub-categories of "playing the complementary role of librarian" and the sub-category of "passing the librarianship course" both gained an average of 7.3. These two categories were omitted due to the lower-than-average mean of 7.5.

- In the classroom dimension, in the main category of "suitable equipment", the sub-category "equipped with high-speed internet," and in the main category of "educational space", the sub-category of "avoidance of internal and external noise" both with an average (9.4) they were recognized as highly important by experts.

- In the dimension of educational resources, experts identified the sub-category of "fiction, science, fiction, literary and religious books" with an average (9.1) as highly important.

Based on the findings shown in Table 7, the second research question can be answered. In this question, the views of experts on the characteristics of the ILLE for primary school children in Iran were discussed.

The study's findings in Table 8 indicated that according to experts in this field, ILLE for primary school children in Iran consists of 4 main dimensions, 19 main, and 89 sub-categories. In other words, these features are the main things that should be used to teach IL to primary school students better.

Table 8
Opinion of IL Experts on the Characteristics of ILLE for Primary School Children in Iran

Dimension	Main Category	Sub-categories
1. Educator	1.1- Ability to define and express information needs	1-1-1. Ability to identify information needs
		1-1-2. Ability to express information needs
		1-1-3. Ability to choose the right tool to find information
		1-1-4. Ability to choose the right strategy to search for the information needed
		1-1-5. Ability to identify required information
		1-1-6. Ability to review public information sources to become familiar with the scope of information needs
	1.2- Ability to select and locate information sources	1-2-1. Ability to locate required information
		1-2-2. Ability to select the appropriate search tool
	1.3- Ability to organize and analyze information	1-3-1. Ability to organize information
		1-3-2. Ability to analyze information
	1.4- Ability to combine, process, and provide searched information	1-4-1. Ability to process information
		1-4-2. Ability to combine information
		1-4-3. Ability to provide information
	1.5- Ability to evaluate the individual	1-5-1. Ability to evaluate individual pieces of information

Dimension	Main Category	Sub-categories
	information retrieval process	1-5-2. Ability to evaluate the information retrieval process
	1.6- Ability to apply ethical principles in scientific activities	1-6-1. Ability to use information ethically
		1-6-2. Ability to comply with copyright laws
		1-6-3. Ability to publish information ethically
2. School Library	2.1- The educational and research role of the library in supporting the curricula	2-1-1. Help increase interest in reading
		2-1-2. Contribute to the development of critical thinking and attitude
		2-1-3. Help expand the concept of education
		2-1-4. Provide education to parents
		2-1-5. Underpinning students' creativity and initiative
	2.2- Library management by a librarian in a scientific and professional manner	2-2-1. Holds a degree in information science and science
		2-2-2. Has IL skills
		2-2-3. Has managerial skills
		2-2-4. Provider of resources
		2-2-5. Resource organizer
		2-2-6. Public service provider
		2-2-7. Seeker of information resources
		2-2-8. Evaluator of information resources
		2-2-9. Library Policy Editor
		2-2-10. Collaborate with teachers and students
	2.3- Ease of access to the library for immediate reference if needed	2-3-1. Specified service hours
		2-3-2. Availability during school activities
		2-3-3. Accessibility for parents and graduate students
		2-3-4. Holding some classes in the library
		2-3-5- Possibility of virtual access to library resources
	2.4- Using support staff as an expert librarian support staff	2-4-1. Assistance in collection
		2-4-2. Help organize resources
		2-4-3. Advice on resource selection
		2-4-4. Assist in holding Q&A sessions and running programs
	2.5- Library as the main center for maintaining and accessing the information resources needed by students	2-5-1. Databases
		2-5-2. References Bibliographies, indexes, abstracts
		2-5-3. Visual and audio sources
		2-5-4. A variety of scientific resources and educational assistance
		2-5-5. General and specialized magazines
		2-5-6. Multimedia materials such as movies, slides, etc.
		2-5-7- Electronic and digital resources
	2.6- Library as an active learning center for students	2-6-1. Develop imagination and lifelong learning
		2-6-2. Problem Research and Diagnosis Center
		2-6-3. Teach how to use information resources
		2-6-4. Expanding students' critical vision, mental

Dimension	Main Category	Sub-categories
		horizon, and worldview
	2.7- The professional role of the librarian in helping to teach the lessons	2-7-1. Help students search for resources
		2-7-2. Prepare and provide the required educational information to the teacher
		2-7-3. Manage online and offline media
	2.8- The advisor role of the librarian next to the teacher	2-8-1. Assist the school's teaching team
		2-8-2. Advice on the use of media in connection with the lessons
		2-8-3. Help design educational lessons
		2-8-4. Student counselor concerning information resources
		2-8-5. Teacher advisor concerning information resources
		2-8-6. Parent counselor regarding information resources
		2-8-7. Membership in the Board of Secretaries
	2.9- Variety of facilities and services of the library and their attractiveness, affecting education and learning	2-9-1. Playing the role of leadership and management
		2-9-2. Personality efficiency
		2-9-3. Interpersonal relationships
		2-9-4. Having problem-solving skills
3. Classroom space	3.1- Educational standards	3-2-1. Laboratory tools and equipment
		3-2-2. A library shelf or cupboard
		3-2-3. Bulletin
	3.2- Appropriate equipment	3-3-1. Equipped with computer
		3-3-2. Equipped with video projector
		3-3-3. Equipped with smart boards
		3-3-4. Equipped with high speed internet
	3.3- Educational space	3-4-1. Classroom status
		3-4-2. Avoid internal and external noise
		3-4-3. Color
		3-4-4. Ventilation and temperature
		3-4-5. Creativity
		3-4-6. Playfulness
		3-4-7. flexibility
4. Educational resources	4.1- Curriculum support resources	4-2-1. Educational help book
		4-2-2. Textbook related content
		4-2-3. Provide content electronically
		4-2-4. Educational software
		4-2-5. Visual and audio sources
		4-2-6. Dynamic display in content
		4-2-7. Periodicals
		4-2-8. Fiction, science, fiction, literary and religious books

Discussion

The concept of information literacy is in the context of the educational system of developed countries, and educational methods also focus on research-based and resource-based methods. In this regard, the appropriate educational environment for information literacy is an infrastructure element. This study identified ILLE for primary school children in Iran. One of the success factors in modern educational systems is having a library whose services and resources are related to school curricula and managed by a specialist librarian. Any change in the education system will lead to parallel changes in the library and its services to the school. That is why various information literacy standards focus on the competencies of librarians and resourceful individuals to link educational programs with the information society.

Findings show that ILLE is an unbalanced quadrilateral whose aspects are intertwined. Two main aspects are "school library" and "Educator". These two aspects show the importance of the school library and the educator as two critical aspects in the ILLE. In recent years in Iran, some fundamental educational system changes have been considered. What is stated in these documents shows the need to pay attention to information literacy in schools. Still, the status of the necessary infrastructure and the appropriate space for teaching students literacy is unclear. The results of some studies have shown the poor condition of most school libraries and insufficient support for these centers (see Hosseini, 2009; Fazeli Dehkordi, 2011). Also, specialized and capable manpower has little place in education transformation programs. The present study highlights the importance of paying attention to this aspect.

The main and sub-categories of "school library" are broader than other aspects. Let's look at the number of sub-categories. The most important of them for the school library is the emphasis on the management of this center by librarians, which, unfortunately, in the current situation and with the removal of school librarians in Iranian schools, has suffered the most. Also, the other two categories in this section have a direct relationship with the expert librarian in the role of consultant and professional for the user community, and this point also emphasizes the role of the school librarian. However, the importance of school library management has been discussed and noted by experts from different aspects in various research (Li, Sinnamon & Kopak, 2022; Drivenes Moore & Trysnes, 2021; Barát, 2016; Fazeli Dehkordi, 2011).

This is why many developed countries pay special attention to the inclusion of information literacy programs in their education system and prioritize the support of school libraries as information centers in schools and the training of specialists to work in these centers. This is a fundamental shortcoming of serious damage to the Iranian educational system, and in addition, the lack of this inadequate infrastructure, along with the allocation of non-specialist manpower to run the library and the lack of specific regulations for training these people, has caused a gap between curricula and activities provided in the library. Another important point of the findings of this study is the importance of the role of the educator as one of the main dimensions of ILLE. Numerous studies have confirmed the role of educators and teachers in information literacy (For example, Wu et al. (2022), Ben Amram et al. (2021), Lamount (2021)).

The present study showed that the educator must master the basic information literacy skills in the first step .This is an issue that makes the elimination of the position of librarian as one of the positions of education in Iran more necessary because the library administration is probably given to teachers who have not received the required training in information literacy, and this contradicts what It is stated in the document of fundamental change as a capable citizen and preparing people to enter the information society. However, training librarians alongside

teachers as developers of information literacy should be through special training that includes both information literacy and school librarianship. Given the shortcomings of the university curriculum in the field of information science and science in Iran and the inadequacy of university courses, the development and implementation of such educational programs seem necessary. The importance of this issue in Fazeli Dehkordi's research (2011) was also well demonstrated. This study identified the basic needs for teaching information literacy to librarians (teaching-learning strategies, resources, and teaching materials) and suggested solutions. Unfortunately, after a decade since the publication of this study, these shortcomings persist.

Therefore, addressing the concept of information literacy to meet the needs of the information society requires providing appropriate infrastructure. The main part is to be equipped with this infrastructure in primary schools. ILLE is one of the parts of this infrastructure. The present study showed the main dimensions of this space in four aspects. Education authorities are expected to benefit from the findings of this study.

Conclusion

Basic planning for information literacy requires several fundamental aspects. One of the most important aspects of this is paying attention to teaching information literacy to children. One of the suitable platforms for this education is school. The school is a place to provide lasting and primary education. Therefore, planning information literacy training is essential, especially in primary school. To be useful, this training requires educators and related rich resources and a suitable context and environment for implementation. In other words, assuming that planning is appropriate and educators are employed and have the necessary resources. However the learning environment is unsuitable, and the probability of successful information literacy training decreases.

The present study showed the four critical dimensions that should be considered as ILLE in primary school: educator, school library, classroom space, and educational resources. The most important category of the educator, which had a higher average, was the "ability to apply ethical principles in scientific activities." Instructors can teach information literacy skills to students explicitly and easily by considering this component. School libraries play an active and leading role in the educational process, a place that contributes to the effective education of students. School libraries are one of the most important places for students, and the librarian also plays an essential role in this education. According to the research findings, nine categories were obtained for the school libraries dimension, the most important of which is the "librarian in the role of library manager," according to experts, which shows the importance of the librarian in the library. Classroom space factors are of particular importance to students. The learning environment affects emotions and how they relate to others. An attractive school facilitates the learning and flourishing of talents, and an inappropriate school minimizes students' enthusiasm and reduces the possibility of dynamism and maturity. One of the categories that can be said that students have good mental health is that students have a happy mood.

In fun education, the classroom learning environment is a priority regarding psychological processing and aesthetics because nothing is like a static and relaxing class. The most important of these components is "appropriate equipment". Providing these components and sub-categories in the classroom creates a suitable environment for learning information literacy, and

students will acquire their information needs with double enthusiasm and spirit. Undoubtedly, educational materials have brought about significant changes in teaching and learning. However, due to the shortcomings and deficiencies in the content of the programs and the way they are presented, the efficiency of these media cannot be fully and optimally used. Educational materials are not appendages of learning and teaching but are a necessary part of it, and ignoring them takes us away from educational goals. Knowledge of educational resources and materials is necessary at the beginning of educational activities. It is not possible to determine goals and methods without considering educational materials. One of the most important activities in any education is the production of educational resources, which is less important than other curricula and more efficient and effective. Educational resources should be selected according to students' attitudes, motivations, and feelings to have the enthusiasm and desire to use them. This study identified a component for this dimension in which the diversity of information resources was significant. It was also identified what components each of these dimensions has and what infrastructure the school information literacy authorities should pay attention to. These dimensions and components can be useful not only in Iranian primary schools but also in other countries under the conditions of their schools.

Suggestions

- According to the findings and the emphasis of information literacy experts on the special importance of the school library as the main pillar of information literacy education for primary school students, it is recommended to provide the necessary ground for the revival of the position of school librarians and the optimal design of school libraries.
- It is suggested that those in charge of planning and education at the primary school level, according to the four dimensions identified in this research and based on the importance of each one, provide the conditions of a suitable environment for teaching and learning information literacy for the students.
- It is suggested to prepare curriculum support resources in school libraries in consultation with information science and IL specialists so that teaching and learning in this field will be more beneficial.
- Since the present study was focused on the primary school level, another research can be done to examine the characteristics of the teaching and learning environment of information literacy for other educational levels and students in universities.
- Other researchers can develop the characteristics identified in this study by changing the method and using the in-depth interview tool to extract the views of information literacy experts. Such research can be presented as a proposal package for implementation in education.

Conflict of interest

The authors declare that they have no affiliations with or involvement in any organization or entity with any financial or non-financial interest in the subject matter or materials discussed in this manuscript.

References

Association of College & Research Libraries (2016). *Framework for information literacy for higher education*. Retrieved from
http://www.ala.org/acrl/files/issues/infolit/framework.pdf

Baji, F, Bigdeli Z, Parsa A. & Haeusler C. (2018). Developing information literacy skills of the 6th grade students using the Big 6 model. *Malaysian Journal of Library & Information Science*, 9;23(1),1-15. https://doi.org/10.22452/mjlis.vol23no1.1

Barát, Á. H. (2016). New education form for school librarians in the master level concerning information literacy. *Philosophy, Communication, Media Sciences*, 4(4), 61-75. http://dx.doi.org/10.22618/TP.PCMS.20164.349007

Batool, SH, Webber S. (2019). A contextual framework for primary education: Fostering information literacy in Pakistan. *Global Knowledge, Memory and Communication*, 68(3), 164-176. https://doi.org/10.1108/GKMC-06-2018-0060

Bawden, D. (2001). Information and digital literacies: A review of concepts. *Journal of documentation*, 5(2), 218-259. https://hcommons.org/deposits/item/hc:20493

Ben Amram, S., Aharony, N. & Bar Ilan J. (2021). Information literacy education in primary schools: A case study. *Journal of Librarianship and Information Science*, 53(2), 349-64. https://doi.org/10.1177/0961000620938132

Bineshian, B, Zerehsaz M. & Mohammadhassani N. (2020). Investigating the role of information literacy in the use of different teaching methods among elementary school teachers. *Library and Information Science Research*, 10(19),205-223. https://doi.org/10.22067/riis.v0i0.80586 [in Persian]

Drivenes, Moore HT, Trysnes I. (2021). Kindergarteners building a library of their own: Using apps to make digital stories and work towards lifelong learning in information literacy. *Journal of Information Literacy*,15(3), 4-19. https://doi.org/10.11645/15.3.2825

Eisenberg, M. B. & Berkowitz, R. E. (2000). *Teaching information & technology skills: The big6 [tm] in secondary schools*. Linworth Publishing, Inc., 480 East Wilson Bridge Road, Suite L, Worthington, OH.

Entwistle, N. J. (1981). *Styles of learning and teaching: An integrated outline of educational psychology for students, teachers and lecturers*. Wiley, Chichester.

Fazeli Dehkordi, N. (2011). *A survey of training needs of librarians in the guidance and high schools in Isfahan on the field of acquiring and use of information literacy skills in teaching and learning process*. Master Thesis. Department of Information Science and Knowledge. Faculty of Education and Psychology. Ferdowsi University of Mashhad. [in Persian]

Frederick, D.E. (2021). Scientific literacy, librarians and information literacy in the post-truth era. *Library Hi Tech News*,38(9): 1-7.

Herring, J. E. (2012). *Year 7 students, information literacy, and transfer: A grounded theory*. Chicago: American Library Association.

Kong, S. C. (2007). The development and validation of an information literacy model for Hong Kong students: key issues in the professional development of teachers for capacity building. *Technology, Pedagogy and Education*. 16(1), 57-75. https://doi.org/10.1080/14759390601168031

Hosseini, M. (2009). Challenges of school libraries in Iran. *Proceedings of the Conference on School Libraries, Dynamics of the Educational System and Participation in the Teaching-Learning Process*. Tehran: Ketabdar. [in Persian]

Lamont, E. L. (2021). An investigation into secondary school teachers' understanding, perception and practice of information literacy and continuous professional development. *Reflective Professional*, 1. https://doi.org/10.48525/rp-2021-id127

Li, A.W., Sinnamon, L.S. & Kopak, R. (2022). Exploring learning opportunities for students in open data portal use across data literacy levels. *Information and Learning Sciences*, 123(9/10), 601-620. http://dx.doi.org/10.1108/ILS-01-2022-0003

Lo, P., Chen, J. C, Dukic, Z., Youn, Y. R., Hirakue, Y., Nakahima, M. & Yang, G. (2014). The roles of the school librarians as information literacy specialists: A comparative study between Hong Kong, Shanghai, South Korea, Taipei and Japan. *New Library World*, 115 (7-8),314-339. http://dx.doi.org/10.1108/NLW-01-2014-0012

Markless, S. & Streatfield, D. R. (2007). Three decades of information literacy: Redefining the parameters. In S. Andretta (ed.), *Change and challenge: Information literacy for the twenty-first century* (pp. 15-36). Adelaide: Auslib Press.

Parisi-Moreno, V., Llonch-Molina, N. & Selfa, M. (2021). Information literacy instruction in early childhood education: The school museum. *Literacy*, 55(2), 83-90. https://doi.org/10.1111/lit.12238

Webber, S. & Johnston, B. (2000). Conceptions of information literacy: New perspectives and implications. *Journal of Information Scienc*e, 26(6), 381-397. https://doi.org/10.1177/016555150002600602

Willison, J. & O'Regan, K. (2005). 2020 Vision: An information literacy continuum for student's primary school to post graduation. In *Higher Education Research and Development Society of Australasia HERDSA Conference*.

Wu, D., Zhou, C., Li, Y. & Chen, M. (2022). Factors associated with teachers' competence to develop students' information literacy: A multilevel approach. *Computers & Education*, 176. http://dx.doi.org/10.1016/j.compedu.2021.104360