



Analytical reflection on teachers' practical knowledge: A case study of exemplary teachers in an educational reform context

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HIGHLIGHTS

- Eight knowledge types were identified as comprising Practical knowledge base of exemplary teachers.
- Two major orientations (content- and learning-centered) characterized the actual practice of exemplary practitioners.
- The significance/interaction of explored knowledge types were different for/across two orientations to classroom teaching.
- Despite educational reform's emphasis on constructivist orientations, outcome-based washback dictates content-based teaching.
- Learning-oriented teachers demonstrated a stronger interaction among different components of their practical knowledge base.

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ABSTRACT

The present qualitative study investigates the practical knowledge of primary school exemplary teachers in an educational reform context. Data were collected through detailed classroom observations and notes, checklists, shadowing the teachers, along with semi-structured and stimulated recall interviews. The findings suggested that the participants possessed eight categories of practical knowledge: subject-matter, pedagogical, learners, classroom management, learning environment, curriculum, school environment, and self. Moreover, a conceptual model was developed couching in the content of teachers' practical knowledge in terms of content-centered versus learning-centered orientations. The findings have significant implication to link theory and practice in the teacher education and development programs.

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1. Introduction

Ensuring the quality of educational systems has been gaining

momentum all over the world and has resulted in educational reforms at different curricular levels (see e.g. Akbari, Parvar, & Kiani, 2017; Fullan, 2016; Secretariat of Plan for National Curriculum Development, 2011). Indeed, given the agency of teachers and the critical role of their knowledge, beliefs, attitudes, qualifications, motivation, and skills, they are argued to be integral in successfully implementing change and ensuring quality at different educational levels (Biesta, Priestley, & Robinson, 2015; Buchanan, 2015; van der Heijden, Geldens, Beijaard, & Popeijus, 2015).

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For the first half of the twentieth century, teaching effectiveness or behaviorist perspective illuminated what types of teachers' behaviors may work, correlate with, or cause certain learning outcomes (Brophy, 1988; Emmer, Everston, & Anderson, 1980; Gage, 1978; Peck & Tucker, 1973) through a process (i.e. systematic observation of learning and teaching) and product (i.e. learning outcomes) research strand (Carter, 1990) and the ensuing "list of specific instructional techniques" (Rosenshine & Stevens, 1986).

Since 1970s, though, the purported failure of process-product strand in capturing the complexities of teaching-learning phenomenon resulted in dissatisfaction with imposing what Schön (1995) called "technical rationality" on the work of practitioners (Gholami, 2009). Emphasizing the knowledge of practitioners rather than the knowledge of science, Schon (1983, p.42) calls for an "epistemology of practice", in which the practitioners, including teachers create their own knowledge through reflection-in-action and reflection-on-action. Teachers' practical knowledge supports the same argument behind the epistemology of practice (Gholami & Husu, 2010; Connelly & Clandinin, 1985; Elbaz, 1991, 1993; Fenstermacher, 1994; Meijer, Verloop, & Beijaard, 1999; Shalem & Slonimsky, 2014; Swart, de Graaff, Onstenk, & Knezic, 2018; Zanting, 2001; Zanting, Verloop, Vermunt & Van Driel, 1998).

Motivated by the paucity of research on (non-Western) primary school teachers in post educational reform contexts (examples of other school levels or contexts are Gholami & Husu, 2010; Akbari & Dadvand, 2014; Barnes, 2017; Ben-Peretz, 2011; Borg, 2003, 2006; Khakbaz, 2013; Mena, Garcia, Clarke, & Barkatsas, 2016; Moradkhani, Akbari, Samar, & Kiany, 2013; Sun, 2012; Swart et al., 2018), this study seeks to extend existing knowledge on teacher practical knowledge, while considering the *phronesis* (elaborated on below in 1.1) as its theoretical root. In fact, as reiterated by Verloop, Van-Driel, and Meijer (2001) and Ben-Peretz (2011), this study addresses the need for more research on teachers' practical knowledge originating from diverse contexts and individual experiences in order to, ultimately, construct a common language among researchers. To this end, the present case study attempts to identify the knowledge base for teaching from the perspective of experienced primary school teachers awarded/nominated as the national/intra-state exemplary, outstanding teaching models. In light of the proposals of the new educational incentive in the country, the differentiation between content-oriented/transmissive/teacher-centered approach (representing the old system) and learning-oriented/student-centered approach (promoted by the new system) were very likely to surface in its extreme forms in the actual practices of Iranian teachers (Gao & Watkins, 2002; Postareff & Lindblom-Ylänne, 2008). Based on the above-mentioned objectives, the following research questions were formulated:

1. How can the content of Iranian experienced primary school teachers' practical knowledge be described and analyzed? What are their shared knowledge contents?
2. How do the identified knowledge bases interact with regard to the teachers' orientation to teaching? What implications would each orientation have for classroom practice and teachers' professional lives?

1.1. Teachers' practical knowledge

Teacher Practical knowledge and epistemology of practice are based on the assumptions of Greek 'practical wisdom'. On this base, teaching is a kind of human conduct close to the concept of *praxis*, and not *theoria* and *poesis*, which has internal goods and guided by *phronesis* or practical reasoning (Gholami, 2009). Drawing on this

philosophy, neo-Aristotelians consider that practical knowledge has its theoretical roots in the concept of *phronesis* (Carr & Kemmis, 1986; W.; Carr, 2004; Dunne, 2003; Kemmis, 2005; Kristjánsson, 2005; Orton, 1997). *Phronesis*, in this meaning, is about dealing with unpredictable kinds of problems and what Kemmis (2005) calls

uncertain practical questions ... that have to be answered-even if the answer is to decide to do nothing ... and certainly compel us to adjudicate between competing goals and values ... where we may choose a solution that maximizes our satisfaction across a range of goals, but some will suffer at the expense of others, ... and we can never predict the outcome of particular situations we choose, still less know what the outcome would have been had we made a different choice. (pp. 404–405)

Perhaps Schwab (1969,1970) can be considered as the grandfather of many scholars who have used the term "practical" in curriculum and teaching studies. Relying on the concepts "practical, semi-practical, and eclectic", Schwab (1970) argued that the pure application of theory in the real world of teaching, where we deal with the real issues, real students, and real teachers is a mistake. Relying on this argument, Elbaz (1981) was among earliest contributors in using the term 'practical knowledge' as a move away from over-emphasizing the importance of 'empirical' and 'analytical' knowledge towards valuing teachers' own tacit and experiential knowledge. In line with the increasing awareness of, scholarship on, and controversy over teacher agency, Elbaz argues that a fundamental premise underpinning this line of research (i.e. knowledge base) is that teachers are not passive users of academic research findings. They should be considered as the key agents who can actively participate in generating legitimate and context-sensitive knowledge (see Biesta et al., 2015; Buchanan, 2015; van der Heijden et al., 2015) Moreover, teachers' practical knowledge is developed through "participating in and reflecting on action and experience," and is dependent on the specific context in which it is materialized (Fenstermacher, 1994, p. 11).

Notwithstanding the significance of practical knowledge in teacher education, Chaharbashloo (2016) and Gholami & Husu (2010) observation about the lack of a concrete consensus in the literature on the concept still persists. Alternative, maybe confusing, terminologies are employed to describe teachers' practical knowledge, among which are teachers' personal practical knowledge (Connelly, Clandinin, & He, 1997; Swart et al., 2018) "craft knowledge, professional craft knowledge, personal practical knowledge, pedagogical content knowledge, or implicit theories" (Zanting, Verloop, Vermunt, & Van Driel, 1998, p. 16; see also; Chou, 2008; Verloop et al., 2001).

Practical knowledge of teachers is concerned with the basic knowledge teachers utilize to act. Beijaard and Verloop (1996) introduce it as the practitioners' knowledge of the classroom situation and practical constraints they confront while teaching. Grossman and Shulman (1994) insist that practical knowledge mainly originates from the events of classroom environment and teaching context. Sun (2012) prefers the work of Clandinin and Connelly for highlighting the personal aspect of practical knowledge, as it "is reflected in the person's background, in the person's present mind and body and in the person's future plans and actions". It is knowledge that reflects the individual's prior knowledge and acknowledges the contextual nature of that teacher's knowledge and it is a kind of knowledge formed by, situations" (Clandinin, 1992, pp. 125–126). The defining characteristics of practical knowledge are explicated in the work of Verloop, van de Riel, Meijer, and Beijaard (Meijer et al., 1999; Verloop et al., 2001). These studies suggested that teachers' practical knowledge is

personal (each teacher's practical knowledge is to some extent unique); contextual (bounded in and adapted to the classroom situation); reflective (it originates in, and develops through, experiences in teaching); tacit (i.e. not often articulated by teachers); it guides teaching practice, and it is content-related).

Practical knowledge in this study is taken "to be an amalgam of all teachers' cognitions, such as declarative and procedural knowledge, beliefs and values, that influences their preactive, interactive, and postactive teaching activities" (Zanting et al., 1998, as cited in; Chou, 2008, p. 529).

The notion of teacher personal practical knowledge suggested a big epistemic shift in research on teaching where teachers are no longer seen as the consumers of others' knowledge; conversely, they are in the position of producing knowledge for their own profession. In Iran, however, until recently educational research was primarily based on positivistic paradigm, ignoring the reflective and practical competencies of teachers. In line with recent reform in Iran's teacher education where reflective practice has been integrated into the teacher education program, research on teachers' practical knowledge needs to become an indispensable part of the reform. As such the present research proposes a relevant and important movement in Iran's today research on teaching in line with the research developed by Connelly and Clandinin during the 1980s.

1.2. Exemplary teachers

Whereas effective teaching is argued to be the ultimate goal of all teacher and teaching-related enterprises, exemplary teachers are expected to be among the most effective, good teachers (e.g. Alhija, 2017; Barnes, 2017; de Vries & Beijaard, 1999). Hativa, Barak, and Simhi (2001, p. 700) conclude from the research on precollege exemplary (or expert) teachers that outstanding teachers differ "in the complexity and sophistication of their thought about teaching, cognitive schemata and pedagogical reasoning skills (Borko & Livingston, 1989), decision making (Westerman, 1991) and in their teaching-related knowledge."

Comparing the notion of exemplary college teacher with other idealized concepts, Lowman (1996) suggests that offering a universally agreed-upon characterization is quite complicated. However, as in the past century, attempts have been made to systematically or observationally investigate and characterize exemplary teaching (e.g. Stronge, Ward, & Grant, 2011; Witte & Jansen, 2016).

Interestingly, the descriptors used in order to illustrate exemplary teachers are not very much different from those used in exemplifying effective, good teachers; characteristics such as: (a) intellectual excitement, being enthusiastic, knowledgeable, inspiring, humorous, clear, engaging, prepared, energetic, fun, stimulating, creative, organized, exciting, communicator; (b) interpersonal concern, being concerned, caring, available, friendly, accessible, approachable, interested, respectful, understanding, and personable; (c) effective motivation, being helpful, encouraging, challenging, fair, demanding, patient, motivating, among others (Arnon & Reichel, 2007; Gholami & Asady, 2014; Hativa, Barak, & Simhi, 2001; Lowman, 1996, p. 37; Sobhani Nejad & Zamani Manesh, 2012; Stronge et al., 2011). In addition, there are some context-dependent variables and criteria to identify exemplary teachers, dealing with differing practices in nomination and selection. Understandably, they culminate in variation in the content of (practical) knowledge base of teachers performing in diverse situations, too (Ariffin, Bush, & Nordin, 2018; Hativa et al., 2001, p. 700).

Appreciating the critical role of exemplary teachers in developing the quality of teaching, several countries including Australia,

the Netherlands, France, Finland, and the United States "are now shifting to making sure that teacher quality becomes the central focus of educational policy" (Ariffin et al., 2018, p. 14). Several American states, including Georgia, Ohio, Texas, and New York, are mentioned by Ariffin et al. (2018) as instances of developing "attractive teacher promotion schemes, which are tied to salary levels" and recognizing "outstanding and exemplary teachers" (p. 15). Furthermore, Scotland, England and New Zealand with their Chartered Teacher and Advanced Chartered Teacher, Leading Practitioners, and Advanced Classroom Expertise Teacher are among the countries recognizing exemplary teachers and relating their expertise pathways to salary and/or promotion. Other countries that can be added to the above-mentioned countries are Malaysia, Republic of Korea, Philippines, and Singapore (Ariffin et al., 2018, p. 15).

In Iran, the teachers used to nominate themselves for the exemplary teacher competition, whereas the current selection procedure is based on state rationing for each of the 31 provinces. Moreover, it involves all school stake-holders including the manager, the principal, the parents, the teachers (under Parent and Teachers' Association), and the students. The initial nomination criteria comprises two major categories: educational (e.g. discipline, commitment, volunteer service, audience awareness, religious devotion, persuasion, and popularity) and professional (scientific-pedagogical including creativity, management, subject knowledge, assessment, and technology awareness) skills.

Generally, the exemplary, lead teachers, according to the schemes and criteria, (are expected to) "develop automatic routines necessary to achieve their goals," "focus more on professional development," be reflective, mentors, more flexible, "share their knowledge and skills with other teachers" and "take up more co-curricular responsibilities and to become academic leaders" (Ariffin et al., 2018, p. 15; see also; Gibbs, 1995; Ibrahim, Aziz, & Nambir, 2013; Robbs & Broyles, 2012).

2. Methodology

2.1. Context of the study

A number of factors make primary education in Iran a noteworthy, yet unique, context for addressing the objectives of the present study. These include special circumstances of Iran as a non-Western, primarily Muslim nation with an ideologically-laden system of education, the new challenges resulting from the recently-introduced educational reforms, the content and curricular requirements of the Ministry of Education, and the added responsibilities of the teachers, among others. The following subsections deal with the educational system of Iran and its reforms after the Islamic revolution along with an outline of the nation's teacher education and recruitment system.

2.1.1. Post-revolution educational system of Iran and the educational reform

Teachers are called *Farhangi* in Iran, translated literally as *associated with culture or cultured*. In the traditional Iranian community, the teachers had a role as knowledge repositories, were highly respected by students and their families; plus, due to the hierarchical social system, they had the authority to control and even physically punish the students (Mohammadrezai & Salari, 2015). Despite a decline in social status of their profession compared to other jobs, the teachers still enjoy a rather high spiritual (moral) influence and social appreciation as well as community trust (Alizadeh & Rezai, 2009; Saam Aram & Ghaempour, 2011; Mohammadrezai & Salari, 2015).

Since the beginning of modern education in Iran, its school

system has undergone four major reforms. The first (1853–1906) and the second period (1907–1979) were before the 1979 Islamic Revolution, while the third (1979–2011) and the fourth (2011–to date) periods pertain to the post-Revolution era (Mousapour, 2008; Motamedi, 1391, Safi, 2008). The Islamic Revolution in Iran (1979) led to several educational changes including replacement of the old system with a (5-3-3-1) system—5 years of primary school, 3 years of guidance school, 3 years of high school, and 1 year of pre-university in the third period. The Organization for Research and Educational Planning obtained full control over the policy setting and the responsibility for supplying and developing educational materials. In this new scheme, the teacher is merely an implementer and moderator, and the situation still, more or less, persists (Mousapour, 2008).

Given recent demographic changes and a decline in the number of Iranian school-year children, education quality, particularly for the initial years, is becoming more important for parents and policy-makers alike. Following the education reform introduced in 2012, formal centralized basic education is divided into four categories: pre-primary, primary, lower-secondary and higher-secondary. Stages two and three are compulsory and free for all Iranian youth. In line with the aims of (primary) education in consolidating the religious and national identities, the following titles pervade in almost all the grades of the six-year primary school: Mathematics, Educating Quran, Experimental Sciences, Persian (Reading) and Persian (Writing Skills), Heaven Gifts (Religious and Moral Education), Social Studies, Thinking and Researching (Just in 6th grade), and Work and Technology (Just in 6th grade). What distinguishes primary education from the next levels is that almost all the courses are taught by a single teacher at each grade; it means the teacher is expected to be familiar with the curricular demands and adept in offering almost all these subjects comprising the grade level s/he is teaching each year.

In line with the higher order, national policy documents, the National Curriculum Document was approved and implemented as a road map for the curricular system to reform the general education system. The syllabi and content of the textbooks as well as the promoted teaching-learning strategies, teacher guides and instructions, and in-service teacher training programs transformed substantially. The new education philosophy as explicated in the policy documents including the *National curriculum of the Islamic Republic of Iran* (2011) promotes: (1) collaborative learning, (2) enriching the educational and learning environment, (3) active participation of the learner in the teaching-learning process and encouraging the learners for learning, (4) the role of the teacher in learning activities as director and facilitator, (5) an emphasis on the learner's role in constructing knowledge, and (6) utilizing modern, progressive teaching approaches and methods.

There are, however, some concerns over the possibility of conceptualizing constructivism in an educational system guided by an ideological, moral agenda. Actually, the question is whether Islamic (or any other) religious and moral education (being integral components of the curriculum while usually viewed as received knowledge) could be amenable to a constructivist approach. It appears that apart from some school content and materials, several school subjects and courses heavily rely on human knowledge, experience, and experimentation (including Math, Persian, Social Studies, Experimental Sciences, and Thinking and Researching) and, consequently, better candidates for teaching and learning within the reform framework. Moreover, a number of contributors to the educational reform have tried to explicate the relationship between the seemingly incompatible approaches of constructivism and religious/moral education by referring to the permissible diversity and plurality of one of the two competing approaches to religious and moral education (Bagheri Noeparast, 2009). In the

religious community, there are at least two major approaches to this type of education; while some strongly believe in the absoluteness of the appearances of the Qur'anic verses (dogmatism), others allow time-dependent interpretations of the holy book. The latter approaches—more in tune with transformational traditionalism and realism-constructivism education philosophies advocated in the reform curriculum—are inspired by progressive Shi'ite religious foundations (Bagheri Noeparast, 2009). Through accepting some uniform principles and rules, they establish grounds for plurality and diversity, and leave room for religious individuals to act in different ways; consequently, there are grounds for treading into the field of active and constructivist education (Bagheri Noeparast, 2009). Overall, the change in orientation from content-oriented approaches to a constructivist one has posed new challenges for the teachers, especially those who have been trained within/for the old system. Additionally, there are still uncertainties and/or unrealistic expectations on the part of other stakeholders (especially parents).

Primary schools in Iran are of different types, all performing under the supervision of Education Ministry and within similar content bounds; they include state, non-profit (actually, for-profit), Shahed (Martyrs' and War Veterans' children), Smart, and Board of Trustees. The participants were from schools for girls (4) and boys (2) as coeducation in Iran is just reserved for post-secondary education. All the classes were equipped with video projector, smart boards, and white boards. All the schools were comparable with regard to the educational space and classroom size.

2.1.2. Primary school teacher education in Iran

In Iran, since 1918, a center was established to educate teachers for teaching in modern schools. The center has diversified over the past 100 years in terms of teacher training practices and in terms of the level of education of teachers. The two main styles adopted were either an approach with a focus on teacher practices (over a two-year period in the Ministry of Education's Teacher Training Colleges) or the approach focusing on academic knowledge (during 4 years at universities) (Mousapour, 2017). Iranian elementary school teachers have been trained within both approaches. With the implementation of the Document on Fundamental Transformation of Education, Farhangian University—with the professed aims of educating, training and empowering teachers and staff of the Ministry of Education and with hundreds of branches nationwide—was established in 2011. None of the teachers included in the study were graduates of the newly-found university, though.

2.2. Participants

Primary school teachers (one male and 10 Female) with an age range of 31–48 years volunteered for the present study. They were all teaching students as young as 7–12 years of age and had varying degrees of teaching experience ranging from 8 to 24 years (Table 1).

Given the situated and personal nature of teachers' practical knowledge and to paint a more comprehensive picture of knowledge base with reference to good teaching practices, we selected the participants from among those teaching in different schools and at different levels of primary education. Therefore, the eleven teachers were selected from six different schools, representing the full primary grades (1 through 6). All these teachers were short-listed and recommended as the best participation candidates by the education ministry experts and supervisors; additionally, they had been nominated and awarded for the national Festival of Exemplary Teaching Model. Exemplary teachers in Iran were annually selected based on a national criterion before 2015, yet they have been nominated by the provinces since then. From among the 11 participants of the current study, there were 3 nationally acclaimed

teachers as well as 8 province-recognized exemplary practitioners.

2.3. Data collection

Data were collected through detailed classroom observations and notes, observation checklists, shadowing the teachers, along with semi-structured and stimulated recall interviews during the schooling year of 2015 and 2016 in Sari, Iran.

Four major steps characterized our data collection procedures: first, a one week observation of each teacher's classroom; second, semi-structured interviews with each teacher to tap into their general approach to teaching components; third, stimulated recall interviews following video-recorded classroom observations, detailed notes and observation checklists; fourth, the final interview reviewing the preceding three steps to have a better, deeper understanding of the obtained data.

The detailed procedures for collecting the data were as follows. First the teachers were informed about the precise timings and procedures of data collection. Then, the actual process of data collecting began. Apart from a number of video-taped observations (which were used in stimulated recall interviews), exact notes were taken of the teachers' actions in all the classes observed. Overall, a number of 11 classes and sessions were observed. Additionally, semi-structured interviews were conducted. Individual teachers were interviewed three or four times formally (through video recordings) and several times less formally (based on the researcher notes and observations) after each session. The first formal interview focused on some general warm-up questions, while more study-specific questions were reserved for the other interviews. Overall, the interview questions were formulated based on the literature and their relevance to the content of teachers' practical knowledge and their nomination and selection as good teaching models. The duration of each formal interview ranged from 90 to 120 min. All interviews were recorded and transcribed verbatim.

Furthermore, the stimulated recall interviews in the present study aimed at gathering relevant data about teachers' underlying thought processes, actions, and decisions (Vesterinen, Toom, & Patrikainen, 2010). The formal observations and interviews for each teacher lasted a whole school day that normally has five 45-min periods. Each participant was interviewed several times and all of the stimulated recall interviews were videotaped. According to an agreed-upon scheme, the researcher and teacher watched the already-videotaped lessons together and then questions were asked about the teachers' explanations and justifications underlying their pedagogical actions in the moment.

2.4. Data analysis

The collected data were analyzed through content analysis

(Krippendorff, 2004). Overall, the following 5 steps were taken to analyze the data from informal and formal (both semi-structured and stimulated recall) interviews: first, transcribing all the interviews, reviewing them, coding the sentences and identifying "the first level themes;" second, classifying 'first-level themes' into 'upper-level' categories as inspired by existing classifications of teacher knowledge base in the literature including those of Shulman (1987) and Elbaz (1981); third, developing a unique teacher-specific categorization for each participant teacher based on the 8 identified knowledge bases in order to shed more light on the content of their practical knowledge. The following two tables exemplify the processes involved in the emergence of one of the knowledge types:

The fourth step was pairwise comparing and contrasting of the content of the teachers' practical knowledge with special reference to their inclination toward the two identified general themes (i.e. knowledge of learners and knowledge of self) and their 'teaching aim' (Table 11); followed by developing conceptual models demonstrating the overlaps and interactions of the knowledge bases (see Figs. 2 and 3).

A number of strategies were adopted to enhance the validity of the results and tackle the problem of rigor in qualitative research studies (see Creswell & Miller, 2000; Flick, 2014; Lincoln & Guba, 1985). To ensure the criteria of credibility, we relied on member-checking and prolonged engagement and interaction of the researcher with the participants. The confirmability standard, also called the criterion of neutrality, was achieved through peer checking; two qualitative research experts were invited as consultants to re-check the extracted themes and also the coding procedure to comment on their accuracy. Furthermore, the dependability criterion was observed by making notes immediately after the field contact, relying on external checks, and re-examining all of the data. Apart from the lead researcher and the two highly qualified qualitative researchers assisting in coding, other research participants (including the project supervisors and advisors) concurred over coding of the data-set through several iterative rounds of intensive analysis and discussion. Familiarity of the research team with the research objectives, social and educational context of the data, and language and concerns of the participants ascertained the consistency of the data analysis across the researchers and also across time. Finally, 'purposeful sampling' was a major step in observing the criterion of transferability (Flick, 2014).

3. Findings

In this section, main findings of the study will be presented in terms of eight identified types of practical teacher knowledge with reference to exemplary teachers' practices. Next, a typology of the content of the teachers' knowledge in terms of major orientations

Table 1
Demographics of the participants.

Participants	Gender	Age	Years of teaching experience	Grades Taught	School Type	Number of Students	Education	Grade Teaching Now
Teacher 1	Female	42	21	All	non-profit	38	A.A. in Elementary Education	5
Teacher 2	Female	40	20	1,3	Shahed	34	A.A. in Elementary Education	2
Teacher 3	Female	41	21	2,3	Shahed	31	A.A. in Elementary Education	4
Teacher 4	Male	45	22	3,4,5	non-profit	36	A.A. in Elementary Education	6
Teacher 5	Female	36	13	1,2,3,4	state	28	B.A in Elementary Education	5
Teacher 6	Female	31	10	3	state	32	B.A Elementary Education	5
Teacher 7	Female	42	23	All	state	34	B.A Elementary Education	6
Teacher 8	Female	44	23	1,4	non-profit	37	B.A. Elementary Education	3
Teacher 9	Female	35	14	4	state	32	M.A. in Education	5
Teacher 10	Female	32	8	1	state	32	A.A. in Elementary Education	2
Teacher 11	Female	48	24	1	state	33	A.A. in Elementary Education	1

Bold value rows indicate teachers tending to adopt a learning-centered orientation.

(either content-oriented or learning-oriented) will be proposed. Finally, the interactions between these knowledge types will be summarized drawing on the above-mentioned orientations.

3.1. The content of each knowledge type

3.1.1. Subject matter knowledge

In this study, subject matter knowledge consists of three major sub-categories: 1) familiarity of teachers with essential educational concepts and content; 2) the relatedness of a specific educational topic to other subjects taught in school; 3) the relevance of educational content to the daily lives of students (e.g. Tables 2 and 3). This knowledge was identified by all the teachers as the corner stone of the teaching profession, but the components of this knowledge were defined in different ways by the participants. For instance, all of the teachers thought that this knowledge comprises mastery over the content of textbooks (Table 3, Participant 4, first interview). In addition, some teachers (4, 6) especially those teaching fifth and sixth grades, believed that subject matter knowledge should go beyond this.

Another component of subject matter knowledge was found to be the relevance of lesson content to students' daily lives. This was emphasized by most of the participants (9 teachers with both content and learner-centered orientations). One of the participants (teacher 1, first stimulated-recall), emphasized benefits of teaching the area of rectangle and trapezoid, in assisting the family purchase home carpets or measuring agricultural land, stated that "the more we relate the educational content to the daily lives of the students, the deeper student learning will be".

Yet another one of the identified components was the relevance of educational concepts and content with the other educational topics taught in school. This was emphasized by 7 teachers from both orientations. This relevance can be achieved either in a 'horizontal' (i.e. being related to the educational content of the same grade) or 'vertical' (i.e. being related to the educational content of the previous grades) mode (e.g. Table 3, Participant 6).

3.1.2. Knowledge of the learners

In the present research, 'knowledge about learners' plays a central role among other kinds of knowledge. The effectiveness of other types of knowledge and educational decision-making were all dependent upon this knowledge. Teachers referred to the following components as the building blocks of knowledge about learners: 1) familiarity with the cognitive characteristics of learners; 2) familiarity with the psychological characteristics of learners; and 3) familiarity with the contextual characteristics of learners. The first component includes familiarity with students' understanding of the learning process and also their misunderstandings and learning problems. All teachers referred to the above-mentioned sub-category because there were heterogeneous (i.e. ordinary, smart, slow) groups of students in the classes they taught, which were perceived by the participants to be a serious challenge to overcome (Table 4, Participants 6 and 8).

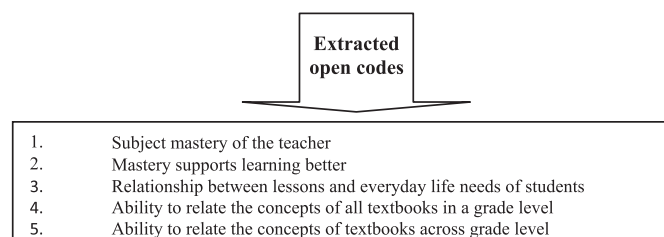


Fig. 1. An example of open-coding of first level themes from raw data.

The second component of knowledge about learners was familiarity with personal, emotional, and mental attributes of students. This subcategory was emphasized by 6 Participants (2, 4, 6, 8, 10, and 11 all learning-oriented along except for 4). Participant 2, for instance, believed that "elementary students are very different in terms of mood, behavior, and personality with high school students" and the teacher needs to "understand their mood and behavior" to be able to "interact with them" in order to "succeed in teaching" (Participants 2, second stimulated-recall interview). (See Table 4).

The third and final sub-category was familiarity with the cultural, economic, religious, and familial backgrounds of students. The findings indicated that not all of the participants emphasized this component. Some teachers (mostly learning-centered—2, 6, 8 and content-oriented 4) believed in its significant influence on the process and the quality of teaching practice. In teaching 'energy journey' unit in Experimental Sciences, it was observed that participant 4, just requested a number of students to bring along experimental equipment from home noting that "... in the city of Sari, some districts are run-down while others are quite affluent. I have students coming from both areas so I need to take this factor into account in my teaching" (see Table 4). Classroom observations confirmed that Participant 2, for instance, used extra-curricular materials to compensate for some of his students' contextual deprivation and bridge the cultural gaps between the students.

3.1.3. Knowledge of curriculum

Iranian teachers are mandated to use the official, unified textbooks provided by the Ministry of Education as their main teaching source. Therefore, elementary school teachers have to use these textbooks for instruction throughout the school year. While content-oriented teachers (1, 3, 4, 5, 7, and 9) only relied on these textbooks, there were others (all learning-oriented: 2, 6, 8, 10, and 11) who, in order to address a wider array of student needs, used extracurricular sources and expressed a critical stance towards the content of formal textbooks (e.g. Table 5, Participant 6, first stimulated-recall interview).

Another component of curricular knowledge was technology use in the classroom. All of the teachers were optimistic about using technology for teaching. They believed it would save time, raise and maintain motivation, and increase students' concentration. They only differed in how they thought technology should be employed. To some teachers, showing instructional movies about a subject was the exact equivalent of teaching that subject (mostly content-oriented teachers: 1, 3, 4, 5, 7, and 9, as well as a learning-centered teacher 11). On the contrary, learning-based teachers only used technology for stabilizing learning (4 teachers: numbers 2, 6, 8, and 10).

3.1.4. Knowledge of classroom management

This knowledge comprises three subcategories: ability to control the classroom, ability to attract students' attention, and ability to manage time. Being able to control the classroom was shared by all the teachers interviewed/observed; its significance was highlighted referring to their large classes and the rather intractable behavior of "today's" students. The findings indicated that the teachers utilized various behavioral (all Participants), ethical (5 teachers: numbers 2, 4, 7, 8, 11), and social strategies (all learning-centered teachers along with teachers 4, 5, 7) to control their classrooms (Table 5).

The second component involves the methods teachers use to get students' attention and increase their concentration. The participants believed that today's students are fairly intelligent but have a rather low level of concentration and pay less attention to the lessons. They attributed these shortcomings to a sedentary lifestyle

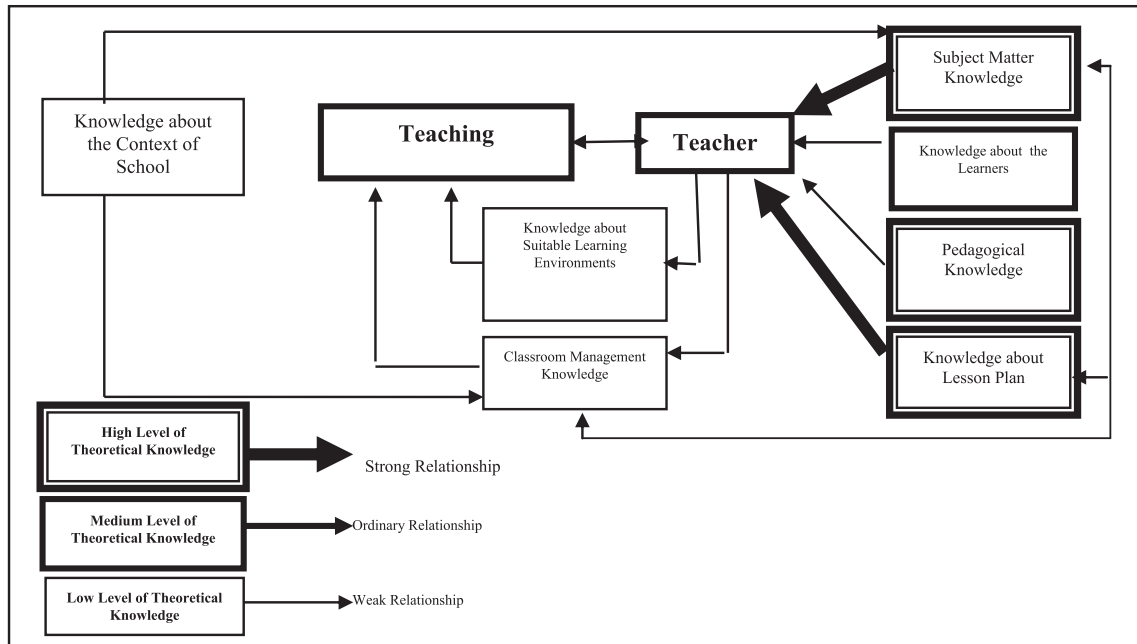


Fig. 2. Schematic representation of the interactions between different knowledge types in content-oriented approach.

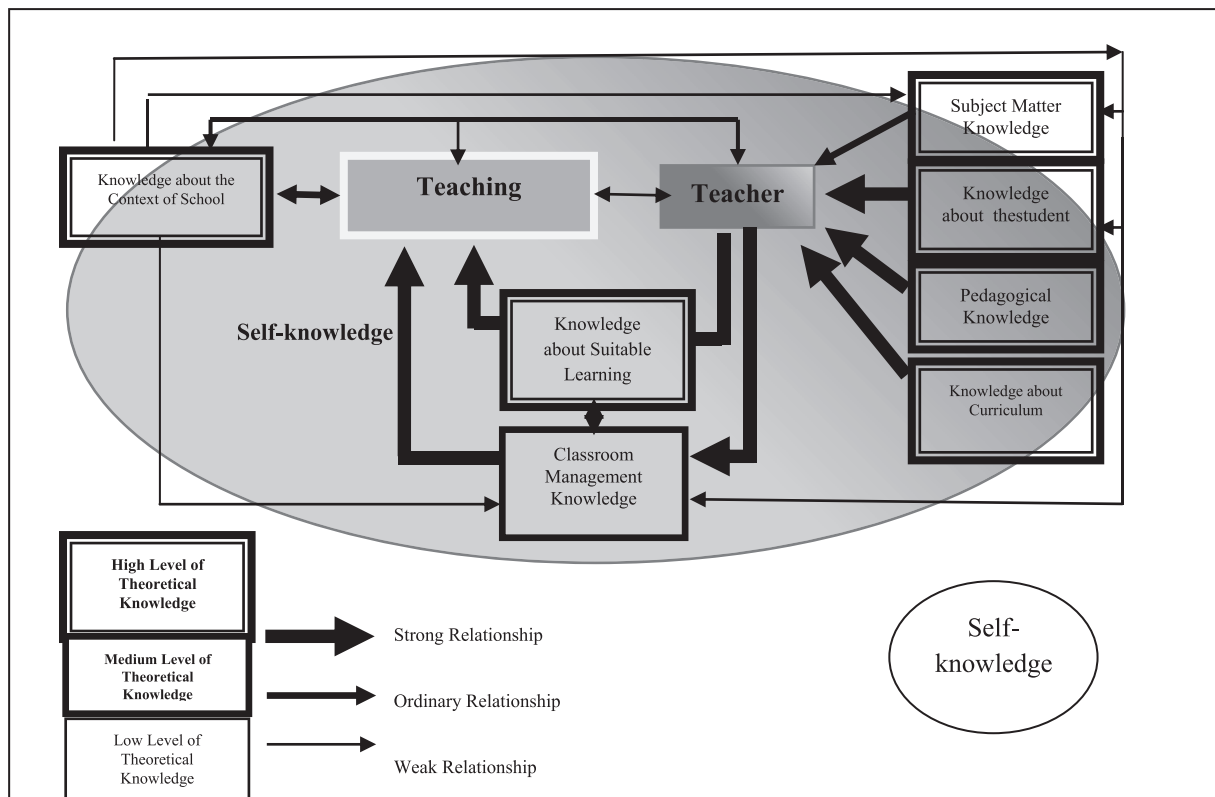


Fig. 3. Schematic representation of the interactions between different knowledge types in learning-oriented Approach (*Note: large oval is self-knowledge affecting the learning-oriented teachers' other knowledge types and their interactions).

and overuse of computer games, smartphones, and tablets as well as their poor familiarity with school environment, especially in first and second grades. The findings indicated that the teachers utilized various individual (8 teachers: all learning-centered plus teachers 5, 3, and 9), and group (all learning oriented teachers generally

teaching lower grades) strategies to “attract the students' attention in the classroom.”

The last component of classroom management is about time management, further subdivided into content and classroom time management. Content management includes the management of

Table 2
An example of data coding for Knowledge of Subject Matter.

Third Level (Selective Coding)	Subject Matter Knowledge		
Second Level (Axial coding)	Mastering the concepts and (structural) propositions of textbooks	Ability in associating the concepts of different textbooks	Relationship between teaching and contemporary issues of the community
First level (Open coding)	The elementary teacher's knowledge should be up to date Mastery facilitates learning better	Familiarity with the headlines and basic concepts of primary school textbooks Familiarity with the structure of concepts presented in the textbooks	Relationship between lessons with the social needs of students Relationship between the educational issues with the needs of society
Subject mastery as a weapon in the hands of the teacher	Identifying the relational pattern between/ among the concepts of primary science books;	Relationship between lessons and everyday life needs of students	
Familiarity with the teaching of general and specific goals of a particular subject Teacher's knowledge should be beyond the content of textbooks	Ability in relating the courses with each other; Good teaching is dependent on combing courses with each other;	Understanding the purpose of the course and its application in everyday life; Understanding how the concepts and propositions of a particular subject matter relate with the values and norms of society;	
Familiarity with the specialized goals of all textbooks	Ability to relate the concepts of all textbooks in a grade level;	Feeling the effectiveness of one's teaching in case of its relation to everyday life	

Table 3
Knowledge of Subject Matter Subcategories, data sources, and example quotations.

Main Category	Example Quotations and their associated subcategories
Knowledge of Subject Matter	<p>Subcategory: Mastering the concepts and (structural) propositions of textbooks "I think that if a teacher does not master basic concepts and topics of the textbooks, he cannot teach well. If the teacher fails to answer the students' questions, he will be labelled as illiterate, which will make the students ignore the teacher's teaching." (Participant 4, first interview)</p> <p>Subcategory: relationship between teaching and contemporary issues of the community Emphasizing benefits of teaching the area of rectangle and trapezoid, the first teacher emphasized in class over its role for them "in assisting the family to purchase home carpets or to measure agricultural land." The participant later argued that "the more we relate the educational content to the daily lives of the students, the deeper student learning will be." (Participant 4, observation and first stimulated-recall)</p> <p>Subcategory: ability in associating the concepts of different textbooks Participant 6, to simplify and teach difficult concepts of a unit dedicated to Noah's Storm (Persian book), associated the concept of 'growth' from Experimental Sciences book 3 and 'area' from Math book 4 declaring, "I tell the children that our studying is [only] beneficial when we can connect between concepts in different textbook. As long as the kids can use the knowledge of history in Persian, this shows that the kids have interacted with that subject. (Observation and First Interview)</p>

Table 4
Knowledge of the Learner, data sources, and example quotations.

Main Category	Example Quotations and their associated subcategories
Knowledge of the Learners	<p>Subcategory: Familiarity with the cognitive characteristics of learners To teach Mathematics and Persian, participants 6 (and 8) used different teaching methods and assignments for the three groups of students in the classroom. It was explained so, "we have heterogeneous students (ordinary, smart, slow) in the classroom who are very different in terms of understanding the course content, reasoning ability, previous knowledge and learning problems. A teacher who does not understand these differences cannot have a good teaching (Participant 6, first and second stimulated-recall interviews)</p> <p>Subcategory: Familiarity with the psychological characteristics of learners Elementary students are very different in terms of mood, behavior, and personality with high school students. Unless you understand their mood and behavior, you cannot interact with them; unless you interact with them, you cannot succeed in teaching. ... Sarah is a sensitive, reticent, and shy student, but Maryam is hyperactive. I try to reinforce any response given by Sarah in order for her to participate in the groups with other kids. But my strategy to control Maryam [is] to use her as a teacher assistant." (Participants 2, second stimulated-recall interview)</p> <p>Subcategory: Familiarity with the contextual characteristics of learners In teaching 'energy journey' unit in Experimental Sciences, it was observed that participant 4, just requested a number of students to bring along experiment equipment from home noting that "... in the city of Sari, some districts are run-down while others are quite affluent. I have students coming from both areas so I need to take this factor into account in my teaching" At the beginning of the [school] year, using the students' profile and [information from their] last year teachers, I identified the students social and economic status. After identification, I tried to group [socially or economically] weak students with rich students in one group ... so that these students do not feel frustrated" (participant 4, first stimulated-recall interview)</p>

teaching a subject matter and a textbook based on the official time allocations. Abiding by the "annual budgeting" and being "able to finish the books" (Participant 1) was the principal concern of teachers (6 content-oriented teachers: 1, 3, 4, 5, 7, and 9) whose main teaching approach was based on transmission of educational content. On the other hand, student-centered teachers (five teachers: 2, 6, 8, 10, 11) gave precedence to the collaboration and "participation of the students in the classroom process" resorting to

various compensatory strategies (e.g. Participant 11, first stimulated recall interview) although they valued classroom time management, too.

3.1.5. Knowledge of desirable learning environments

Data analysis indicates that knowledge of desirable learning environment can be divided into physical and positive mental environments. The former consists of the classroom and school

Table 5
Knowledge of Curriculum Subcategories, data sources, and quotations.

Category	Example Quotations and their associated subcategories
Knowledge of Curriculum	<p>Subcategory: Critical awareness of curriculum and Ability in using extracurricular resources according to the learners' needs Look, the volume of newly-compiled books has decreased, yet the topics in each page have increased. It [i.e. the book] just mentions some lessons in passing, like the vertebrates ... likewise about gases and liquids I used supplementary resources including scientific information. On the other hand, because my classes' students are not homogeneous, I use gifted supplementary books for gifted kids like Vahid (Participant 6, first stimulated-Recall Interview)</p>
	<p>Subcategory: Ability in using educational technology in the classroom To teach the concepts of the nest/hive [a single word used in Persian], Participant 2, first began the lesson through question and answer routine with learners. For example, "where do we go after school is over?" If the answer was home, "what do we do at home? ... Do you think the animals need a home, too? What is an animal house called? ..." After the learners found a general understanding about the concept of nest/hive, the teacher played the educational movie. He paused the movie several times, asked some questions beyond the book. For example, "who can tell if the nest of all animals is like that of a sparrow? Why are the nests unlike each other?" The lesson was started this way. On the complementarity of educational technology, Participant 2 commented, "I played a movie for the lesson on the bee hive, to complement my discussion. For example, I would create motivation, played the movie, and I ask the kids who can get the message of the lesson. I used the summary of a documentary." (First stimulated-recall interview)</p>

Table 6
Knowledge of Classroom Management Subcategories, data sources, and example quotations.

Category	Example Quotations and their associated subcategories	
Classroom Management	<p>Subcategory: Classroom control and decreasing undesirable behaviors and increasing desirable behaviors Behavioral Strategy: I normally fine Arash's disruptive behavior to prevent their being repeated, so I asked him to write the assignment twice ... (participant 1, first stimulated-recall interview) Ethical Strategy: Look, Susan is now a sixth grader, she is from a divorced family ... I tried to ameliorate her rudeness and mischievousness as well as her need for affection as a mother does through a friendly conversation and in the classroom telling the story of Imam Ali (PBUH) ..." (participant 7, observation checklist) Social Strategies: "... I think that in order to be able to control Vahid's mischievousness in the classroom, I put him in charge of the library and monitoring the classroom [class representative]. I told him that before my arrival in the classroom, my desk should be arranged ... This way there will be less conflicts between Vahid and the rest of the students' (participant 5, first stimulated-recall interview)</p>	
	<p>Subcategory: Attracting the students' attention in the classroom Individual Strategies: Participant (10) pointed out that "... The second-grade kids are mischievous ... I usually use the strategies of reading their number from attendance book, requiring their sitting still with folded arms, reminding and warning, asking questions while teaching, or reading in turn, attention I will draw the children ..." (, participant 10, checklist and second stimulated-recall). Group Strategies: "... I usually draw the children's attention to myself through their reading poetry collectively and participating the learners in group activities" (participant 6, observation checklist and first interview)</p>	
	<p>Subcategory: Time management "... We have annual budgeting for teaching lesson. The large numbers of students and implementation of different educational policies in the classroom have resulted in my being short of time. If I do not manage, I will not be able to finish the books in a timely manner during the [school] year ..." (Participant 1, observation checklist and first interview). "As you observed, I often encounter shortage of time because of the participation of students in the classroom process. I usually change class times to make up for lack of time and teaching lessons that are easier and the children learn them more quickly (Participant 11, first stimulated-recall Interview)</p>	

environments. All of the teachers under study referred to classrooms with proper facilities such as good lighting, proper desks, appropriate air conditioning systems, (smart) whiteboards, proper size, while five (generally learning-oriented) teachers (2, 3, 4, 8, 11) made remarks about the importance of suitable school environment and its influence on the quality of learning (Table 7).

The latter, however, involved creating a positive psychological atmosphere in the classroom. Data analysis yielded 3 subcategories for this knowledge type, including creation of a safe and suitable environment for students emphasized by predominantly learner-oriented teachers (2, 4, 6, 8, and 11), establishing constructive relation with the learners stressed by all student-centered teachers (2, 6, 8, 10, 11 plus teacher 4), and provision of empathy and assistance so that students can procure solutions for their problems emphasized by 6 teachers (2, 3, 4, 6, 8, 10) (Table 7).

The reason for the importance of this kind of knowledge as a part of good practice was first to help families (divorced or addict parents) who caused ethical and behavioral problems for their children, and second to deal with an apparent decline in the ethical principles of the society (e.g. Participant 8).

3.1.6. Pedagogical knowledge

The participants noted that possessing subject matter knowledge is not necessarily a guarantee for good practice. For instance,

participant 2 stated that "everybody thinks that by solving arithmetic problems such as 2 plus 2 makes 4, they are actually teaching arithmetic to students". Generally, this knowledge comprises designing lesson plan, teaching methods and models, and assessment (Table 8).

Almost all teachers mentioned lesson plan, yet they had different ideas about the significance of actually having one. Some of them did not believe in preparing a well-thought-out lesson plan and instead thought that having a general outline or teaching based on experience would suffice in order to enrich the pedagogical environment and include the learners' needs in the process of teaching (all learner-centered practitioners). There were other teachers, however, who prepared a detailed lesson plan based on what they (were) expected to teach and exactly finished it on time (6 content-oriented teachers: 1, 3, 4, 5, 7, and 9).

With regard to teaching methods, the approach of some participants was predominantly based on the teaching guide provided by the Ministry of Education for each subject area (6 content-oriented teachers: 1, 3, 4, 5, 7, 9). As an example, participant number 5 commented that "when I am teaching Persian Literature or History, I usually use lecturing or question and answer techniques, but when it comes to basic sciences I tend to use group work and collaborative techniques ... the choice of each technique is based on the teaching guides" (comparable with participant 3,

Table 7
Knowledge of Desirable Learning Environment Subcategories, data sources, and example quotations.

Category	Example Quotations and their associated subcategories
Knowledge of Desirable Learning Environments	<p>Subcategory: Physical Environment “Look! A good learning environment is important for me based on its space; I don’t care about the number of smart and weak students. Class size is very important for me. The seats should be good. The color of the class should be happy ...” (Participant 9, second interview, Classroom Environments) The third teacher believed that the school should be such a pleasing and happy place where the learners would be willing to come to school ... School walls should have attractive paintings and a playground ... Well, all of these will make the kid enthusiastic and eager to participate in classroom” (Participant 3, first interview, School Environments)</p>
	<p>Subcategory: Positive Psychological-Social Environment In response to singing in the classroom and telling jokes in the classroom, Participant (11) stated, “... Look! The cheerfulness of the class, in my opinion, makes their learning stick in their minds. If the classroom environment is not happy and is fearful, your student will not be participate and learn in the classroom” (Checklist and interview, Creation of a Safe and Suitable Environment for Students)</p>
	<p>The relationship between teacher and student should be like the relationship between Mother and child. It should be so close so that you can be successful in [teaching] your lessons. If you do not relate, they will not understand whatever you do ...” (Participant 10, first interview, Establishing Constructive Relation with Learners) “... Unless I align myself with Pouya, who is a divorce kid, sit beside him and hold him, let him tell me his pain, where can he [emotionally] empty himself. I’m in touch with him via telephone on a weekly basis. So doing, the child pays more attention to the classroom [teaching]. [He] can feel more relaxed and comfortable” (Participant 8, Second Stimulated-Recall Interview, Provision of Empathy and Assistance)</p>

Table 8). There were other teachers (all five learner-oriented practitioners: 2, 6, 8, 10, 11) who used an eclectic approach drawing on various techniques; for instance, participant 2 explained since “the most difficult concept in the second grade” for most students “is the quadripartite asymmetry, ...besides educational clips,” he used “Problem solving method and art, too” (first stimulated-recall interview).

Finally, assessment is another part of pedagogical knowledge. What was common among the teachers concernig this component was their reliance on descriptive or qualitative assessment approaches (in the first three grades rather than in the final grades of elementary school). Under this approach, there was the new collaborative method of assessment used in schools in which the students' learning problems were collected, categorized, evaluated and analyzed. The teachers relied on the active participation of the students and their parents. The differences, however, were in their choices of different tools for assessment and the suitability of these tools for students' conditions. For majority of the teachers (7 teachers), the criterion for successful delivery of new material was the question and answer technique and doing homework. For 4 teachers (2, 6, 8, 11, all student-centered), however, it was techniques such as weekly quizzes, question and answer, homework, and peer assessment (e.g. participant 6 in Table 8); plus, various assignments were given to the students based on their cognitive styles and readiness.

3.1.7. Knowledge of school context

One of the most influential types of knowledge referred to by teachers as a pre-requisite for good practice was knowledge about

the context of the school. This knowledge consists of the following components: teacher's awareness about the role of parents in student's learning and the ability to interact with them and awareness of school culture. Teachers' successful interaction and collaboration with parents (emphasized by all teachers) along with their familiarity school context (underscored by predominantly learner-based teachers: 2, 4, 6, 10, and 11) was believed to affect the quality of their teaching practices.

However, research participants differed in the way they interacted with the school staff and the parents. Possessing knowledge about the role of school culture in teaching, some teachers (e.g. teachers 2, 6, 11) used interactions with school staff and parents to improve their teaching. Conversely, there were seven (mostly content-centered) teachers (1, 3, 4, 5, 7, 9, plus 10) who appeared to encounter teaching problems because of lack of interaction with school staff and parents (several of these points are raised by Participant 10 in Table 9).

3.1.8. Knowledge of self

This knowledge was about the personal and reflective characteristics of teachers. The findings of the present research demonstrated that self-knowledge was perceived to have a significant role in good practice. Based on this knowledge, two groups of teachers were identified.

The first groups of teachers were highly motivated and professed a sense of responsibility and high professional expectations (generally leaner-oriented participants 2, 4, 6, 10, and 11). They were aware of their strengths and weaknesses. Thus, teachers in this group were highly reflective about their practice before, during

Table 8
Pedagogical Knowledge Subcategories, data sources, and example quotations.

Category	Example Quotations and their associated subcategories
Pedagogical Knowledge	<p>Subcategory: Ability in designing the syllabus “Look! Having a daily lesson plan, based on annual budgeting, is good but the teacher should not be limited to it because classroom situation and teaching is unpredictable. it’s a loss of creativity in students ...” (Participant 2, second interview, observation checklist)</p>
	<p>Subcategory: Familiarity with teaching methods and models “Mastering is very important but it isn’t everything ... In addition to mastery, the teacher should know teaching methods and be able to use them in the classroom ... Each course requires its own teaching method For example, Math is a lesson that children have to see objectively and do apprenticeship, yet Persian is not like that and can be taught to the students through drama and storytelling ” (Participant 3, first interview)</p>
	<p>Subcategory: Evaluating the learners Participant 6 commented about his weekly tests that, “I think it’s very important for a teacher to know the right time for teaching the new lesson. Along with question and answer, I usually use weekly tests, homework assignments, and peer assessment to if the students actually could understand the lesson or not? ... ” (Participant 6, observation checklist and subsequent 4th interview)</p>

and after teaching. Participant 10, for instance, jotted down highlights of her daily teaching in her notebook; she reiterated that “teaching is a really challenging activity ... My mind is always involved. When I get home I say why I performed this way, wasn't it better if I had worked differently ...” (third stimulated-recall interview).

The second group (teachers 1, 3, 4, 5, 7, 9), however, were seriously challenged by the bulky textbooks as well as the guidelines on classroom control dictated by authorities. Furthermore, they were not adequately motivated and attributed educational failure to the indolence and indifference of parents (e.g. Participant 4). Observations of these teachers revealed that their lessons could be poor, and they showed less engagement with the events in the classroom.

3.2. A typology of teacher knowledge

In this section, a typology of teacher knowledge is generated by drawing on the differences and similarities amongst participating teachers and with regard to the above-mentioned types of knowledge. In line with current knowledge on teaching approach (Askari Matin, Kiany, & Samar, 2018; Kember, 1997; Kember & Kwan, 2000; Postareff & Lindblom-Ylänne, 2008), our findings pointed to the identification of the content-oriented and learning-oriented approaches to teaching (Table 11). Furthermore, a framework detailing the interactions between the aforementioned types of knowledge and the teachers' practices is proposed (Figs. 2 and 3).

3.2.1. Teacher knowledge within the content-oriented approach

Within this approach, teachers are seen as the sources of knowledge with learning conceptualized as the process of transferring the knowledge to students. As participant 3 commented “my most important goal is to transfer knowledge to students”. The main goal of these teachers was for students to pass their final exams and go to the next grade. The students were thought of as blank slates. So during the observations, a passive role for them was witnessed as they were the receivers of knowledge from their teachers. It appeared that learning was presumed to be an easy, natural process and the outcome of teaching. Overall, several rounds of analyzing the data, resulted in proposing the following schematic conceptual framework of knowledge types and their interactions.

As it is shown in Fig. 2, among the identified types of knowledge, subject matter, pedagogical and curriculum knowledge appeared to have greater effect on content-oriented teachers' practices. In other words, good practice, according to the participants, was predicated based on possessing these three types of knowledge. The teachers' familiarity with components and sub-components of other types of knowledge was limited and they could barely utilize these

knowledge types to improve their teaching. Also, they believed that it is possible to successfully manage the classroom simply by relying on subject matter knowledge. Nevertheless, due to limited familiarity with the psychological and contextual characteristics of the students and their individual differences, they were more likely to fail to create a calm and happy atmosphere in the classroom. Consequently, it could alienate the students from the class and thus cause a host of control-related problems for the teachers. To deal with this problem, they would have to frequently resort to principals' authoritative help. They were also more likely to encounter many interactional problems with the parents.

3.2.2. Teacher knowledge within the learning-oriented approach

Within this approach, the main aim is to spark students' passion for learning. As participant 6 maintained, “my most important purpose in teaching is creating motivation and interest in my students so that they can become autonomous.” Here, students are seen as creators of knowledge and teaching is viewed as a challenging undertaking due to the individual differences which exist among them. Also, learning is thought of as a complex process and is dependent on the learners. Overall, iterative analysis of the data resulted in proposing the following schematic conceptual framework of knowledge types and their interactions:

As shown in Fig. 3, learning-oriented teachers are highly familiar with the eight identified knowledge types. Based on analysis of the data, it can be argued that these teachers were highly focused on thinking about the content of their practical knowledge. Recognizing teaching as a challenging activity, they tried to connect the identified types of knowledge to one another. This is closely related to their personal attributes, especially reflective thinking abilities which underpinned their teaching (hence, the overlapping knowledge of self in the model). The findings indicated that many of the classroom decisions made by these teachers were based on their knowledge about the learners. Increasing their knowledge about the learners, they tried to match instructional materials with the mental characteristics and psychological states of the students. Moreover, through interacting with the students, these teachers prevented significant tensions in the classrooms. Another impact of the interaction between different types of knowledge, besides facilitating learning, was to ease the challenging confrontations between the parents, the school, and the teachers. In contrast to the content-oriented approach, within this approach, knowledge about the context of school was not of primary importance for increasing subject matter knowledge.

4. Discussion and conclusions

The present research reported the partial findings of a larger

Table 9
Knowledge of School Context Subcategories, data sources, and example quotations.

Category	Example Quotations and their associated subcategories
Knowledge of School Context	<p>Subcategory: Ability in constructive interaction with the parents I think the parents' effectiveness is 80 percent especially at the lower grade levels Not only does a constructive cooperation with parents enhance student learning, it also reduces students' behavioral and moral problems, and this helps me in classroom management. (Participant 9, Third interview)</p> <p>Subcategory: Familiarity with the school atmosphere and culture (interaction among school members) Participant (10) did not have a good interaction with the school staff, and most of the time she would stay in the classroom during the break [instead of going to the school office.] “When I was in Tehran, I was interacted considerable with the colleagues and the school manager. I came up with many creative ideas for the classroom with the help of teachers, and I was encouraged by the school manager ... When I came here, I thought it was the same atmosphere ... now that I'm here for about 3 years, there is a negative relationship among colleagues. Everyone works for themselves, and the individual matters. My school manager does not assist me in implementing my plans in the class Good teaching in elementary level requires the interaction of me as the teacher, school staff, and the parents, more like a triangle ... (First stimulated-recall interview)</p>

Table 10
Knowledge of Self Subcategories, data sources, and example quotations.

Category	Example Quotations and their associated subcategories
Knowledge of Self	<p>Subcategory: Teacher characteristics Participant (8) entered the classroom half an hour earlier to address learners' learning problems. He justified this practice saying, "Look, the teacher feels compassion and responsibility as parents do. All of these students are my children. When I am a teacher, I am also a mother ... I myself feel responsible for my kids, so I also feel responsible for the learners. Look, when I leave the class, I'm worried something might happen to a kid. I have to be there on time so that nothing happens to the kids. Look, my responsibility increases exponentially." (Participant 8, observation checklist and first interview) "... if I do the same thing in two or three lessons and they are identical, I'm not satisfied. When I feel good. When it satisfies me; I judge. Today, I had problem adjusting the telescope while teaching experimental sciences, and it annoyed me and I was not much content with my work ..." (Participant 6, third stimulated-recall interview)</p> <p>Subcategory: Reflective Thinking Participants 10, for instance, jotted down highlights of her daily teaching in her notebook; she reiterated that "teaching is a really challenging activity ... My mind is always involved. When I get home I say why I performed this way, wasn't it better if I had worked differently ... My mind is really preoccupied. I am so obsessed with my teaching, for instance, with my teaching style, when I go home I tell my family that I treated this learner like this, or he did that, or his family said so. Wasn't it better if had said so ... or a student did that and I reacted so, wasn't it better if I do this instead?" (Third stimulated-recall interview) "... When I see the majority of the kids have gotten the same question wrong, I reflect asking why it is like this. I have so much work that I do not have time to think a lot about it or look for a new solution ..." (Participant 4, third interview)</p>

Table 11
Two approaches to teaching with regard to the content of the teachers' practical knowledge and the participants oriented more toward each approach.

Knowledge	Content-oriented Approach	Learning-oriented Approach
Subject Matter	Teachers possess a lot of subject matter knowledge with regard to their view and purpose of teaching, they limit their teaching to the content of textbooks	Teachers possess complete familiarity with the components of subject matter knowledge but their teaching is not limited to this knowledge.
Learners	Low level of familiarity, emphasis on being familiar with the learning process of students, low level of in-class participation of students, low familiarity of students with the content of lessons	High level of familiarity, a balanced perspective which combines the cognitive and psychological characteristics of students, high level of in-class participation, learners are thought of as highly familiar with content of lessons and creative
Curriculum	Teachers depended for their teaching on textbook contents and imposed mandates, rarely used extra teaching materials, were too much reliant on technology for teaching	They knew about the weak points of textbooks and mandatory curricular requirements, used extra teaching materials, used technology to consolidate student learning
Classroom Management	Teachers are not in control, prefer behavioral measures for controlling unruly behavior, emphasize content management, faced problems with getting students' attention	They use behavioral, social, and ethical measures according to student type/ personality, do not emphasize content management, usually face time constraints due to using collaborative teaching activities
Suitable Learning Environments	Teachers emphasize physical suitability of class atmosphere	They emphasize psychological and social suitability of class atmosphere along with physical
Pedagogy	Teachers depend considerably on teaching guides, unable to use active teaching approaches in the classroom, plan lessons based all of the content, assess learners through question and answer	They do not depend very much on teaching guides, utilize eclectic and collaborative approaches based on the characteristics of students and the classroom, design flexible lesson plans based on learner needs, assess students using a variety of assessment tools
Context of School	Teachers are unable to interact successfully with school staff and parents, have limited contact with school personnel and when they do it is for procurement of educational equipment, their teaching is strictly based on the guidelines set down by the school principal and the policy makers	They are highly sociable, successfully interact with school staff and parents, interact with school personnel if students' behavioral problems become acute
Self-Knowledge	Teachers reflect superficially, are lesson-oriented, lack patience, unwilling to learn	They reflect deeply, lesson and ethics oriented, creative, willing to learn, expected a lot from themselves
Participants	1,3,4,5,7,9	2,6,8,10,11

qualitative exploration of the practical knowledge base of eleven select, experienced teachers. The study could be considered among the few systematic attempts to explore the content of officially-acclaimed exemplary teachers' practical knowledge as enacted in the context of the Iranian post-reform education system. It is hoped that our findings can yield valuable insights into the content of teachers' practical knowledge, at least, as far as the lived experiences of the so-called "excellent teaching models" are concerned. It should be noted again (c.f. Introduction) that the two strands of research (i.e. teacher's practical knowledge as well as exemplary

teachers) can be regarded as competing and even contradictory. Actually, in-depth analysis of the practical narratives of our state-sanctioned exemplary sample revealed that, similar to other teachers, they have differing (and not necessarily unanimous) accounts in practice.

The eight identified categories in our study (Table 11 and Figs. 2 and 3) were quite in line with those suggested in the previous studies (e.g. Gholami, 2009; Borko & Putnam, 1996; Chen, 2009; Elbaz, 1981; Meijer et al., 1999; Moradkhani et al., 2013; Shulman, 1987; Turner-Bisset, 1999; van Driel, Verloop & de Vos, 1997;

Zantinget al., 1998). It appears, though, that the overt orientation of the curriculum in promoting religious, national and ideological identities of the students under subject courses (Quran and Heaven Gifts) led our informants to subsume the ethical (religious-theist) knowledge category we expected to overtly observe (Askari Matin et al., 2018).

Although the main purpose of this study was to identify the shared knowledge base in light of the claimed exemplary, excellent teaching models, the findings (e.g. Table 3–10) indicated that the supposedly experienced, select teachers appeared very distinct from each other in how they defined and enacted the content of practical knowledge. This is in line with the research literature (e.g. Meijer et al., 1999), which generally posits that, despite similarities in teachers' practical knowledge, they greatly differ with respect to the teaching (of reading comprehension). Generally, as depicted vividly in the explanation of the eight knowledge types and the teachers' subscribing to them, it could be contended that, regarding previous research findings in the literature (e.g. Askari Matin et al., 2018; Postareff & Lindblom-Ylänne, 2008), making clear-cut distinctions between the different teachers' approaches is not an accurate portrayal of classroom realities; it is more realistic to consider the two approaches (content-oriented and transmissive versus learning centered and constructivist approach) as two ends of a continuum within a reformed curriculum in action rather than a categorical dichotomy (Table 11). Teacher number 4 who was seemingly a content-oriented practitioner shared several orientations and knowledge types with learning-centered teachers, too. In general, despite attempts in compromising and accommodating both orientations, the mismatch between the requirements of the two systems can partially explain a retreat to the established, more comfortable content-oriented approach in the actual classrooms.

Another important finding of this study, elaborated on in sections 4.1.1 through 4.1.8, was that the teachers inclining towards a learning-centered perspective were able to mention more elements of the content of their practical knowledge; plus, they made more complex connections between the identified knowledge bases (both verbalizing them and actualizing them in their observed classroom practices) (Fig. 3 versus Fig. 2). One main reason behind this finding could be related to their reflective thinking. These teachers welcomed teaching profession as a challenge, were very much concerned about the everyday events of classroom life, and were also constantly evaluating and reflecting on their own teaching practice (hence the oval in Fig. 2). Content-oriented teachers, notwithstanding, were more concerned about subject-matter knowledge and to a lesser extent about pedagogical knowledge and curriculum knowledge. These teachers seemed to be underestimating the other knowledge types. Such tendencies were in agreement with these teachers' main objective in the classroom, which was the transmission of knowledge and content of the school textbooks (Gao & Watkins, 2002; Postareff & Lindblom-Ylänne, 2008). This finding could accentuate Meijer et al. (1999) contention that a limited practical knowledge is related to the teachers' less self-reflection and critique of their own thoughts and teaching. Therefore, it could be maintained that a learning-centered approach is a more comprehensive and integrative alternative compared to a content-centered approach to teaching (Gao & Watkins, 2002; Postareff & Lindblom-Ylänne, 2008).

Our findings, including the highlighted rows of Table 1 as well as our explanation of Table 3 through 8, revealed that the teachers who were teaching in higher grades were more inclined to adopt a content-oriented approach. It should also be mentioned that almost half of the teachers (Numbers 1, 3, 4, 5, 7, and 9) were more oriented towards content end of the spectrum. It could be explained with reference to the evaluation system in schools as

well as the culture of learning and teaching in the Iranian context. As elaborated in the section on the context of Iran, the changes brought about by educational reform laid the foundation for major reforms in curriculum, instruction, and roles of teachers and learners under the influence of constructivism (Askari Matin et al., 2018; Secretariat of Curriculum Development Plan, 2011). However, the evaluation system has not changed in accordance with these reforms. The main criteria for evaluating both teachers and students are still heavily positivistic and focus on metric norms in line with final exams and preparing students for obtaining higher ratings and admission to specific schools such as gifted and the talented ones (e.g. section 4.1.4. above). For instance, Participants 9 and 4 highlighted the preoccupation of parents, managers, and even education bureau assessors with quantifiable classroom achievement (i.e. perfect score) and tangible success in competitive exams (e.g. gifted school entrance) rather than "how much the students' knowledge and attitudes has changed, or how much their group and social skills are strengthened" (Participant 4, second stimulated-recall interview). Therefore, the current evaluation system could act as a major obstacle for evaluating teachers and students, and it may push teachers to adopt more content-centered approaches in their teaching (Lim and Pyvis, 2012; Tavakoli & Baniasad-Azad, 2017).

On the other hand, it could also be argued that an interest in adopting a content-centered approach towards teaching may have its roots in Iran's individualistic mentality which is in turn reflected in its educational system (Farasatkah, 2015). This is because adopting a learning-centered approach may require the stakeholders to subscribe to more holistic and collectivist thinking systems. However, given that this is currently not the case; the rapport between parents (who feel unjustified extra financial burden) and teachers (who feel challenged and unacknowledged) has weakened (e.g. sections 4.17. and 4.1.8). It seems to be aggravated by the parents' (implicit and explicit) preference for a content-centered education especially at higher grade levels. Overall, it could be argued that the problems ailing the education and evaluation system which are both caused and intensified by the centrality of content-centered instruction, aggravated by the seemingly individualistic mentality prevailing in the educational culture, stand in stark contrast to the concept of 'education' which the so-called reforms of the national curriculum claimed to promote.

Inasmuch as the present research is among the few attempts to study the content of primary school teachers' practical knowledge in the context of Iran and with reference to exemplary teaching practice models, it can have implications for the teacher education curriculum and educational policy makers. Attending to the content of teachers' reflection can be a beneficial way for modifying and developing the practical knowledge of content-oriented teachers. Achieving the goals of the national reform document, namely, participatory learning and active participation of the learner in the learning process depends on increasing teacher education and changing the focal point of teachers' reflection from just the concept of teaching and the subject matter (to other knowledge types); they also depend on the need to refine the evaluation culture in schools and the social expectations from the teachers especially in higher grades.

Additionally, not being restricted to subject matter knowledge or the like, the elaborate, integrated, interactive content of the practical knowledge of the learning-centered teachers (Fig. 3) can lay the foundation for a more comprehensive, robust (complementary) criteria in implementing curricular innovations—like the reform curriculum of Iran—as well as choosing exemplary teachers. Based on our suggested typology, it can be concluded that the knowledge of the participating exemplary teachers functions like a filter in interpreting national curriculum innovations (cf.

Abdelhafez, 2014; van Driel et al., 1997). Given the seemingly more comprehensive approach of learning-centered Iranian exemplary teachers as well as the backwash effect of any official criteria for selecting exemplary teachers on teachers' actual practices, the decision-makers are humbly invited to revise their selection criteria in favor of a broader, more comprehensive set of standards conducive to their educational reform agenda in light of studies like ours.

Although qualitative methodology, such as the current one, can provide invaluable insights into the practice of teaching in an underrepresented context (like Iran), it can affect the transferability of the results to other contexts (in spite of the attempts to observe the four qualitative research criteria). Therefore, we suggest that similar studies with larger samples and in both similar and varied contexts be conducted in order to explore and/or verify the proposed conceptual frameworks for practical knowledge bases and identified categories within a more varied, wider scope.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.tate.2019.102931>.

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