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To cite this article: Daihu Yang (2013) Comparing Assessments Within Junior Geography Textbooks Used in Mainland China, *Journal of Geography*, 112:2, 58-67, DOI: [10.1080/00221341.2011.648211](https://doi.org/10.1080/00221341.2011.648211)

To link to this article: <https://doi.org/10.1080/00221341.2011.648211>



Published online: 31 Jan 2013.



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ABSTRACT

The 2001 Geography Standards for Junior Secondary Schools are the first national standards for geographic education since the founding of Communist China. The standards heralded several new ideas for geographic education, and textbook assessments are one important way for understanding their impact. This study examines the changes in assessments by comparing assessments in older geography textbooks with new geography textbooks written in accordance with the new standards. The assessments were investigated in terms of their taxonomy, type, design, and general qualities.

Key Words: *textbook assessments, geography curriculum, China*

INTRODUCTION

Previously the Chinese educational system was characterized as a state monopoly with centralized management (Baskan and Erduran 2009). As such, textbook form and content strictly followed government specifications (Yuan 2001). Textbooks were increasingly outdated (Lam 2007). Before 2001 geography textbooks written in accordance with the state geography syllabus changed little, and did not improve students' overall geographic literacy (Zhao 2004). In general, content and skill development were sacrificed to prepare students for high-stakes exams.

An important setback for geography came in 1993 when the discipline was excluded from the National Admission Exam for Universities & Colleges (NAEUC), the most important exam in China. When a subject is included in the NAEUC it means that this subject is considered more important than other subjects in the crowded curricula. This setback was partially driven by the perception that geography was just an accumulation of facts and rote memorization of geographic knowledge (Gao 2003). The exclusion of geography from NAEUC inevitably transmitted a negative message to junior schools. The message was that geography was not important, and, as a result, was further marginalized.

Importantly, education reform in the early 2000s allowed geography education to attempt a reversal of previous policy. As China's social and economic system changed rapidly, pressure demanding educational reform grew. In 2001 the Chinese government released the Outlines for Basic Education Curriculum Reform. This reform refocused textbook writing from a subject-centered to a student-centered approach (Ministry of Education 2001a). New Geography Standards for Junior Secondary Schools also were formulated and issued in 2001.

The new standards are quite different from that in the old state syllabus. In the past the syllabus was primarily concerned with content knowledge. The new standards stated that geographic education should expand from the narrow focus on the acquisition of the subject knowledge to the broad cultivation of overall geography literacy useful for students' lives and life-long development (Ministry of Education 2001b). The new standards urged a switch from traditional in-class information transmission to inquiry-based teaching. With regard to the assessment of students' performance, the old syllabus primarily focused on the learning products of subject knowledge via a paper exam; the new standards stress the evaluation of the students' learning process focused on more than a single exam.

By 2005 the old state syllabus-based geography textbooks had been replaced nationwide by the new standards-based geography textbooks (Li 2004). After the geography curriculum reform, affective and psychomotor abilities were given equal importance with cognitive abilities in the objectives of geographic education. Higher-order thinking, too, was emphasized as students are now expected to analyze and synthesize geographic information. Assessments are required to be shorter and more diverse, using multiple types of assessment such as writing and other activities.

This study examines how the assessments in geography textbooks changed following the implementation of the new standards by conducting a comparison of the assessments within the older syllabus-based and newer standards-based textbooks. Specifically, we asked the following questions: (1) did the

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assessment quantity change? (2) how did assessments for cognitive, affective, and psychomotor abilities change? (3) did the assessment type change? (4) are the new ideas articulated in the new standards embodied in the assessments?

METHODS

Textbook Selection

One result of the curriculum reform was a change in the geography textbook publishing system. Before the release of the new standards, junior textbook writing and publishing were mainly assigned to the largest and semi-official textbook publishing house, the People's Education Publisher (PEP) (Lai 1991). There were a few limited versions of geography textbooks written and published by others. According to Yuan (2001), prior to 2001 more than 90 percent of schools in mainland China adopted the geography textbooks by the PEP. Now, the government has relaxed their strict control of textbook writing and publishing. More publishers have been encouraged to enter the geography textbook market so that competition would improve the quality of the textbooks and cater to different needs of local schools. Despite a smaller market share, the PEP still dominated much of the geography textbook market in mainland China. According to Zhang (2011), the adoption rate of the textbooks by the PEP fluctuated between 50 percent and 80 percent after the curriculum reform. As the PEP was and is still the largest publisher of geography textbooks, we used their texts in our analysis.

This study used a series of texts for grades seven and eight where geography is compulsory. Specifically compared are four older syllabus-based geography textbooks (geography part one and two—grade seven and geography part three and four—grade eight) and four standards-based textbooks (grade seven geography book one and two and grade eight geography book one and two). The year of publication for the four syllabus-based textbooks was 2001, and 2006–2009 for the four standards-based textbooks. The above two sets of geography textbooks were designed for junior students aged around 12–14.

Procedures

Among the selected research methods were: content analysis (Gordy, Hogan, and Pritchard 2004; Krippendorff 2004; Standish 2008; Alkis 2009; Erdogan, Marcinkowski, and Ok 2009), a case study, and a questionnaire. Because one part of the study is the effect of assessments on cognitive, affective, and psychomotor learning, we tried to find a hierarchical classification scheme to classify the assessments according to the expected learning outcomes. Several schemes by Bloom *et al.* (1956), Krathwohl, Bloom, and Masia (1964), Krathwohl (2002), Harrow (1972), Barrett (1976), and Anderson *et al.* (2008) had been compared and evaluated. Finally, the taxonomies by Bloom,

Harrow, and Krathwohl were adopted because (1) their taxonomies of educational objectives for the three domains were well known and understood in China's education system; (2) the geography standards clearly stated the three domains as the major learning outcomes in geographic education and the standards' classification of cognitive levels was more aligned with the Bloom's; and (3) the researchers could reach a relatively high degree of consensus when using the three classic classifications. We do note that our consensus regarding the coding of *create* was low, an outcome also experienced by Liu *et al.* (2010).

We first independently counted the number of assessments section by section for each textbook, carefully using the same criteria to distinguish what counted as an *assessment* since some larger assessments actually contained *subassessments*. The assessments were then classified according to the taxonomies. To ensure the inter-reliability, we independently chose one randomly selected chapter from one randomly selected syllabus-based textbook and one randomly selected chapter from one randomly selected standards-based textbook to ensure that we were consistent in our pilot coding. We then each independently coded all assessments in the eight textbooks section by section. When differences arose in our assessment coding, we relied on five students to help us place them within the taxonomy. The level of difficulty that a student felt while performing the assessment was an important signal because the taxonomies were based on a framework from simple to complex. The category of an assessment was determined when more than half of the students reached a consensus on the level of difficulty of an assessment. With regard to the affective and psychomotor domains, we did not further categorize them into sublevels. For instance, it is hard to judge a student's willingness to participate in a discussion without direct observation. Examples of our categorized assessments are shown in Table 1. We used emergent coding (Stemler 2001) to classify the types of assessments and present examples in Table 2.

To better understand the general qualities of the assessments, a questionnaire was developed by referencing Yasar (2009). The questionnaire was sent to ten geography teachers, each with more than fifteen years teaching experience in junior schools with both the syllabus-based and standards-based textbooks. Each question in the questionnaire (see Table 6) was rated on a scale with *none* (0), *poor* (1), *fair* (2), *good* (3), and *excellent* (4) in terms of their estimation of the existence and extent of improvement.

This study is limited in the following respects. First, according to Gottschalk (1995), coding errors can only be minimized and not fully eliminated. Second, the sample size for the questionnaire is small, but this could be expanded in the future. Third, the questions in the questionnaire were only assessed by teachers and may differ somewhat from students.

Table 1. Assessment classification by taxonomy.

Category	Explanation	Examples from Textbooks
Cognitive	Knowledge	Recall data, information, or facts.
	Comprehension	Understand the meaning of ideas, concepts, and explain the reasons behind geographic problems or phenomena.
	Application	Use knowledge, ideas, theories, laws, or concepts in a new or given situation.
	Analysis	Divide material, concepts, or problems into parts to understand it more clearly.
	Synthesis	Solve problems or generate products and ideas by combining knowledge, concepts, or elements together.
Affective	Facilitate the awareness and growth in attitudes, values, and feelings.	Evaluation
		Make judgments about ideas, issues, or actions.
Psychomotor	Require students to do something physically.	

Table 2. A sample of assessment types.

Types	Explanation	Examples from Textbooks
Tables-related assessments	Generate changes, laws, and trends from numbers in tables and explain the possible reasons behind.	Explain the differences in the three industrial sectors according to the table.
Illustrations-related assessments	State, explain, extract, analyze, compare, or generate information, objects, meanings, changes, laws, and trends from maps, graphs, diagrams, pictures, and images, and explain the possible reasons behind.	Read the world temperature isoline map and explain the changes in temperature from the equator to the two poles and the reasons.
Demonstration	Making exhibitions or shows related to certain topics.	Collect news and pictures about the North Pole from newspapers and magazines and make a small exhibition concerning the environmental protection of the North Pole.
Answer questions	Solve problems or questions with a short oral answer or a short/long written answer.	State what the major factors affecting industrial distribution are.
Filling or marking on maps	Identify the objects and write their name on a map or mark the omitted objects on a map.	Write the name of the mountain on the map. Mark the Three Gorges Hydropower Station on the map.

RESULTS

The Amount of the Assessments

The amount of assessments in the two sets of textbooks is presented in Figure 1. Regarding the older syllabus-based textbooks, the number of total assessments is nearly equal in grade seven geography (part one, two) and grade eight (part three), and declines for grade eight (part four). If geography (part one, two) are considered as one group (the two textbooks relating to the world geography), then the average number of assessments per page is 1.91. If geography (part three, four) are considered as one group

(the two textbooks relating to the geography of China), the average number of assessments per page is 2.13. One might infer that the authors gave priority to students learning about the geography of China over world physical and human geography. There are 826 assessments in the four syllabus-based textbooks. Usually, Chinese students are required to finish all these assessments. Some have sought to reduce these assessments (Zhu 2010) believing that they are excessive and counter to student learning as most do not test for higher-level thinking.

Regarding the newer textbooks, if grade seven geography (book one, two) are considered as one group (again, the two textbooks pertaining to the world geography), the average number of assessments per page is 1.35. If grade eight geography (book one, two) are considered as one group (also, the two textbooks pertaining to the geography of China), the average number of assessments per page is 1.06. The first observation here is that as China's connections with the outside world are increasingly interwoven with other places, it makes sense that students should be well-informed about other cultures and peoples. The decrease in the number of assessments also is clearly shown. Fewer and better assessments that target higher-level thinking is now the goal.

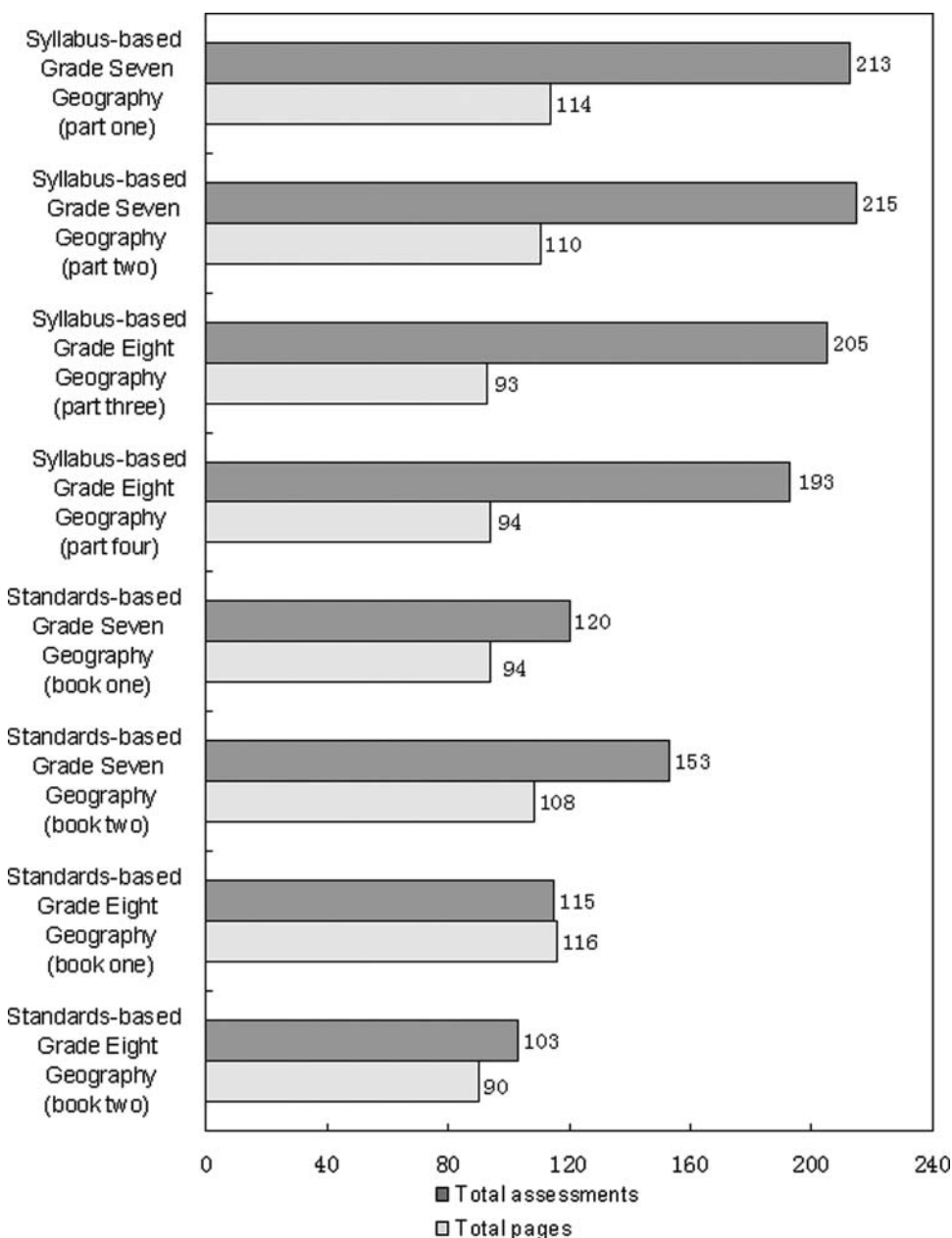


Figure 1. The number of assessments and assessment pages for each textbook.

Taxonomies Represented in the Assessments

As shown in Table 3, a large number of assessments are those at the knowledge and comprehension levels of the cognitive domain in all syllabus-based textbooks, collectively nearly 90 percent of the total. Other aspects, such as synthesis, are negligible. Most assessments in the four syllabus-based textbooks are factual assessments, mostly asking students to recall what they had learned. Admittedly, higher-order thinking does depend on some basic geographic knowledge, but too many assessments at the knowledge level gives students the impression that geography is simply about rote memorization (Holliday, Whittaker, and Loose 1984). This partly explains why Chinese students thought geography was less useful; so little attention was paid to higher-order

Table 3. Assessment percentage by textbook set and taxonomy.

Textbooks	Taxonomy							
	Knowledge	Comprehension	Application	Analysis	Synthesis	Evaluation	Affective	Psychomotor
Four syllabus-based textbooks (%)	59.9	27.7	5.7	2.3	0.2	0.0	2.4	1.7
Four standards-based textbooks (%)	34.0	38.1	7.1	6.5	5.7	3.7	2.0	2.9

thinking and affective and psychomotor abilities that Chinese students could achieve good scores on exams, but could not solve practical problems.

The assessments for the knowledge and comprehension levels still constitute a large portion of the four standards-based geography textbooks, sharing 34 percent and 38.1 percent of total assessments respectively. The other areas also show gains compared to the older texts. While these changes are small, they clearly show a move in a new direction.

Regarding taxonomies, Table 4 shows that the most striking change between the two sets of textbooks is the drastic drop of the assessments at the knowledge level, which fell from 495 in all syllabus-based textbooks to 167 in all standards-based textbooks. The total number of comprehension assessments also fell appreciably from 229 in all syllabus-based textbooks to 187 in all standards-based textbooks. While the total number of assessments at the ap-

plication and affective levels also fell, there was no change in the total number of psychomotor assessments. However, synthesis and evaluation both increased modestly.

Unfortunately, though the new standards are supposed to give equal importance to the affective and psychomotor areas as well as the cognitive, the former are still neglected. Importantly, some studies indicate that the neglect of affect and psychomotor areas reduces the engagement of both students and teachers alike (Noddings 1996; Zhang 2004). In the end, the primary improvement lies in the redistribution of the different levels of thinking in the cognitive domain, resulting in intermediate and higher-order thinking assessments.

Assessment Types

The general distribution of the types of assessments is presented in Table 5. Two types dominate: illustration-related assessments and answer question.

Table 4. Assessment number by textbook and taxonomy.

Textbooks	Taxonomy							
	Knowledge	Comprehension	Application	Analysis	Synthesis	Evaluation	Affective	Psychomotor
Syllabus-based geography (part one)	117	68	13	4	0	0	6	5
Syllabus-based geography (part two)	141	51	10	6	0	0	5	2
Syllabus-based geography (part three)	128	53	12	3	1	0	4	4
Syllabus-based geography (part four)	109	57	12	6	1	0	5	3
Standards-based grade seven geography (book one)	41	39	13	6	6	3	2	10
Standards-based grade seven geography (book two)	62	60	9	7	5	4	5	1
Standards-based grade eight geography (book one)	37	45	7	9	8	5	3	1
Standards-based grade eight geography (book two)	27	43	6	10	9	6	0	2

Table 5. Assessment number by textbook and type.

Textbooks	Types of Assessments												
	Tables —related assessments	Illustrations —related assessments	Filling blanks	Demonstration	Matching	Multiple-choice	Conundrum	Answer question	Writing	True or False	Action-related assessments	Filling or marking on maps	Calculation
Syllabus-based geography (part one)	0	83	7	1	1	2	0	102	1	0	5	1	10
Syllabus-based geography (part two)	0	108	1	1	1	1	0	98	0	1	2	0	2
Syllabus-based geography (part three)	5	75	7	1	3	0	1	95	1	0	4	7	6
Syllabus-based geography (part four)	6	62	9	1	2	1	0	93	5	0	3	9	2
Standards-based grade seven geography (book one)	2	46	11	2	0	1	0	34	1	0	10	3	10
Standards-based grade seven geography (book two)	2	103	10	3	0	1	0	31	0	0	1	1	1
Standards-based grade eight geography (book one)	3	46	11	1	0	0	0	41	3	0	1	6	3
Standards-based grade eight geography (book two)	1	50	9	0	1	0	0	33	4	0	2	2	1

Illustration-related assessments occupy a larger share in the older geography (part one, two) (two textbooks relating to the world geography) than older geography (part three, four) (two textbooks relating to the geography of China). This means that world geography placed more emphasis on illustration-related abilities. Regarding the newer books, illustration-related assessments predominate, although answer questions is still sizable. Here the number of illustrations remains highest for world regional geography, largely because students rely heavily on maps and diagrams in order to understand the cultural, economic, and physical aspects of foreign countries. Clearly not much has changed here between the two book sets, and we would hope to see greater variety in the future.

Assessment Design

The goals of the new geography standards are to improve learning processes, connect geography to students' lives, and present diverse learning activities. We compared the design of assessments to see whether these changed between the two textbook sets. Figure 2 and Figure 3 were extracted from the older syllabus and newer standards-based textbooks; both deal with water resources.


In the syllabus-based textbook, the student mainly gains an awareness of the importance of water by calculating the huge amount of water that can be saved through conservation. Even though the calculated results are enormous, the student may have no concrete idea what the numbers mean. Likewise, whether they will take actions to save water during their lives is uncertain. However, in the assessment in the standards-based textbook, the student must do more than calculate. They must conduct work outside of class and learn that water usage will vary from household to household. When sharing their water-saving plan in class, they must confront the merits and deficiencies in each other's water-saving plan. These newer assessments come closer to achieving the standards goals that were seen in the earlier texts.

Assessment Quality

Before the geography curriculum reform, geographic education was mostly criticized for problems such as excessive schoolwork that was not focused on real-world issues (Yuan and Lou 1999; Fan *et al.* 2001; Ren and Yang 2008). The new geography standards were designed to improve this, and our questionnaire focused on teacher

Table 6. Assessment quality by means of teachers' ratings.

	Means of teachers ratings									
	Four Syllabus-based Geography Textbooks					Four Standards-based Geography Textbooks				
	None (0)	Poor (1)	Fair (2)	Good (3)	Excellent (4)	None (0)	Poor (1)	Fair (2)	Good (3)	Excellent (4)
Twenty-four Questions										
Are the assessments appropriate to students' age and level?			3.6					2.9		
Do the assessments cover a variety of topics and issues?			2.3					2.9		
Are there diverse types of assessments?			1.3					1.5		
Is the amount of assessments satisfactory?			1.2					2.8		
Do the assessments promote the fostering of values, attitudes and motor skills?			1.3					1.5		
Are the assessments designed in a way to attract students' interest?			1.3					2.5		
Are the assessments designed in a way to provoke students to ask geographic questions?			1.5					2.3		
Do the assessments help develop critical thinking, problem solving, and decision making skills?			1.5					3.2		
Do the assessments provide additional resources for students to expand their knowledge?			1.3					3.1		
Do the assessments relate to students' real and daily lives?			1.6					3.3		
Are the assessments set in a real-world context or a real problem?			1.6					3.3		
Do the assessments encourage diverse activities?			1.5					2.5		
Do the assessments encourage students to interpret and answer in a personal manner?			2					2.7		
Are answers to the assessments open-ended?			1.8					3.3		
Do the assessments encourage students to apply geographic knowledge to their lives?			1.6					2.9		
Do the assessments encourage student self-learning and acquisition?			1.6					2.6		
Are the assessments interdisciplinary?			1.5					1.8		
Do the assessments encourage hands-on work?			1.4					1.8		
Do the assessments allow students to demonstrate or showcase their work?			1.7					1.9		
Are there durative assessments that will encourage students' long-term engagement?			1.2					1.9		
Are the assessments designed in a way that stresses both the learning process and product?			1.5					3.1		
Are the assessments de-politicized?			2.2					2.8		
Are the assessment and evaluation tools provided?			0					0		
Do the assessments encourage creativity?			0.8					1.7		
Total			37.3					58.3		
Average (Total value/24)			1.55					2.43		



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2. 我国最大的工业城市上海，日供水量为400万吨，供水管道的漏失率为10%。假如把漏失率减少一半，每日可以节约多少万吨水？
3. 我们每个家庭每天节约1千克水，全班同学的家庭合计，每天共节约多少千克水？一个月呢？一年呢？

Figure 2. Water resources assessment in the older syllabus-based textbook. The text translation:

Let us figure out the following questions:

1. If agriculture uses 450 billion cubic meters of water annually and if the efficiency for water use increases by 10 percent, how many cubic meters of water will be saved annually?
2. The daily water use for Shanghai city, the largest industrial city in China, is 4 million tons. The ratio of water loss from pipes' leaking to daily water use is 10 percent. If the ratio is decreased by half, how many tons of water can be saved?
3. If one kilogram of water is saved each day for every family of our whole class, how much water can be saved for all families of our class? How much for a month? How much for a year?

perceptions between the two book sets. Table 6 shows that in the older syllabus-based textbooks the ratings for most assessments fall between *poor* and *fair*. The newer standards-based textbooks have higher ratings, mostly between *fair* and *good*. The only question to receive a lower value for the newer books concerned the appropriateness of the assessment to the students' age and developmental level. Most teachers thought that some of the newer assessments were too difficult. In general, most categories are seen as improved, including having less overt political propaganda within the text. In the past, assessments asked students to enumerate the great achievements since the founding of Communist China. Depoliticization was slightly improved in the standards-based textbooks as there were fewer assessments directly praising the government. Some implicit examples remain, however. For instance, an assessment in grade eight geography (book one) asked students to compare the figures in a graph concerning the agricultural output before and after Communist China, hinting at the great achievements made by the Communist Party.

CONCLUSIONS

Assessments are an integral and important part of Chinese textbooks and are used to measure competency in geographic knowledge and skills. Assessments can also be used to gauge the government's changing thoughts about geographic education. Several significant changes were observed by comparing two sets of textbooks. First, the newer standards-based textbooks abandoned the overwhelming repetition drills as this strategy did not improve students' geographic learning (Ma 2011). Instead, an attitude of quality over quantity has been implemented where the application of geographic knowledge and skills

第三章 中国的自然资源

(2) 按下表所列项目调查一下你的家庭用水情况, 在全班讨论, 交流各种可行、有效的家庭节水方法, 并制订家庭节水计划 (供城市同学选作)。

家庭用水调查

你和你的家人	有	没有
 刷牙时或淋浴中抹香皂时, 有没有关上水龙头?		
 淘米、洗菜的水, 有没有用在别的地方 (浇花、冲厕所等)?		
 有没有使用节水龙头或节水器具?		
 有没有经常用水解冻或冷却食物?		
 洗碗筷时有没有把水龙头关掉?		
 水龙头有没有漏水?		
 有没有过量使用清洁剂?		
 有没有把衣服储满洗衣机才清洗?		
 上月份你家缴付的水费是多少?		
制订家庭节水计划: _____	建议你和你家人实施家庭节水计划, 看看一个月后能节约多少水。	

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Figure 3. Water resources assessment in the newer standards-based textbook. The text translation:

Please inquire about your family's water use with the following questions. Discuss possible and effective ways to save water and make a family water savings plan.

- Do you shut off the water tap when you brush teeth or take a bath?
- Is the used water from rice and vegetable washing reused elsewhere, such as watering the flowers in your garden?
- Have you used the water-saving taps or utensils?
- Do you often use water to melt frozen food or to cool food?
- Do you shut off the water tap when you wash dishes and chopsticks?
- Does the water tap leak?
- Do you overuse the detergent?
- Is your washing machine full with clothes when washing?
- How many water rates were charged for your family last month?

Find more water savings options and make a water-saving plan with your family members. Find how much water will be saved after implementation for a month and explain why you chose the options in your plan.

is valued. Second, we observed that the older syllabus-based textbooks concentrated on the knowledge and comprehension cognitive levels. This situation was reversed for the newer standards-based textbooks as higher-order thinking assessments became more numerous. Finally, the general quality of assessments in the newer standards-based textbooks improved. However, certain deficiencies remain. Little attention was given to the affective and psychomotor domains.

In sum, the changes in assessments from the syllabus-based to the standards-based geography textbooks represent a modest improvement. But textbooks are just one small part of the larger Chinese geographic education process and improvements are also needed in the examination system, teacher training, and teachers' beliefs about geography's importance (Lam 2007). Without these additional reforms, the improvements in standards and textbook assessments will be of small consequence.

ACKNOWLEDGMENTS

The author would like to thank Zhenzhen Deng, Chen Liu, the PEP, and the students from Hefei No. 59 Secondary School for their assistance and participation in this study. Also, many thanks go to the anonymous reviewers for their constructive comments. Last but not the least, my heartfelt gratitude is directed to the editor, Jerry Mitchell, whose great help made the publication of this article possible. This article is written as part of the Anhui Provincial Education Planning Program (JG10187).

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