



Original Article

The impact of the hidden curriculum components on cognitive characteristics of high school students' learning

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Abstract

Introduction: The effectiveness of the hidden curriculum is stronger than the explicit curriculum from the perspectives of curriculum experts as well as medical education specialists in the educational dimensions, especially in transmitting values, norms, and medical professionalism. The present study aimed to explore the effects of the hidden curriculum components on cognitive characteristics of students' learning, and to create a better learning and educational setting.

Materials and Methods: The research was a mixed method by using a cross-sectional survey in the quantitative section. A case study (phenomenological research of lived experience type) and the interviews were used in the qualitative part. The population consisted of 277 male high school students in District 1 of Bandar Abbas city-Iran in the academic year 2019-2020. They were selected through the cluster sampling method and randomly assigned to the experimental research. Data were gathered by the Cognitive Characteristics of Learning Questionnaire and the Hidden Curriculum Components Questionnaire. Structural equation modeling, Pearson correlation coefficient and multiple regression analysis were used to analyze the data in the quantitative way.

Results: The results of multiple regression showed that there was a correlation (0.0567) between the components of the hidden curriculum with cognitive characteristics of learning that was significant at (0.095) confidence level. The quantitative findings showed the mean scores of most components in exceptional talents (SAMPAD) high school was significantly higher than the mean scores in public and non-public high schools ($P < 0.050$).

Conclusion: Generally, it can be concluded that the hidden curriculum plays an important role through the implicit transfer of values, attitudes, and skills to students, especially on cognitive characteristics, so that these issues need to be given more attention by the educators in every educational setting.

Keywords: Cognitive characteristics, Components, Curriculum, Learning

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Introduction

School is considered one of the most important social institutions that provide equal educational opportunities for individuals (1). Although preparing children for adult life is a common goal of society and school, it is

certainly not a simple task (2). The vision of society has been the responsibility of schools, and that vision has been translated into school goals. All school experiences presented to meet the needs of society make up a school curriculum (3). The curriculum is one of the

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essential tools and elements for achieving educational goals and missions. Thus, it tries to transfer different types of knowledge and skills to learners through designing and developing a specific curriculum to prepare them to take on their roles and responsibilities in life (4).

Educators have addressed the different types of curricula in school. According to Eisner, all schools should teach three types of curricula: the implicit (hidden), the null, and the explicit (5).

For more than two decades, an increasing enthusiasm has emerged in grasping invisible, tacit, un-official, and non-academic aspects of school life, that is, the "hidden curriculum," which is considered an inevitable essential part of school activities (6). Curriculum planners and educators believe that schools often teach pre-defined goals that are an essential part of school activities besides intentional and guided learning (7). The term the hidden curriculum has been defined in several ways. The same concept of the "hidden curriculum" is used in different terms, such as the "latent," the "covert", and the "unstudied" curriculum by some scholars (8).

Nowrouzi et al. pointed out that the hidden curriculum term should be classically defined as the un-official, un-written, and often unintended lessons, values, and perspectives that students learn in school (9). The hidden curriculum concept depends on the knowledge that students learn lessons in the classroom that may or may not be considered a part of the explicit (formal) curriculum (10).

The positive consequences of the hidden curriculum are healthy habits, scientific and spiritual interests, artistic taste and aesthetics, good morals, conscientiousness, respect for humanity, healthy competition, collaboration, and altruism (11). Despite the profound impact on formal curricula in values and norms on learners and students (12), these consequences are not primarily approved by the official schools and university administrators and have been neglected in Iranian schools and universities (13). Most curriculum experts and medical education professors have also compared the effects of the hidden and the explicit curriculum. They have concluded that the effects of the hidden curriculum in terms of education, especially in transferring values and norms, are far more potent than the explicit curriculum (14). Therefore, in the training of medical students and specialists, in addition to

the knowledge and skills, we must pay more attention to the development and strengthening of the values, attitudes, norms, social skills, and other characteristics that shape the behavior of physicians, as well as the role of the hidden curriculum (15). Therefore, the importance and the effects of the hidden curriculum in medical education are undeniable, so that Cohen asserts that perhaps more than ever, attention to the hidden curriculum is needed in the training of physicians (16).

Kian et al., in their research, concluded that there was a significant positive relationship between the components of the hidden curriculum and creativity, especially in terms of school social setting (17). Abbaspour et al. conducted a qualitative study to investigate nursing students' experiences of the Midwifery Faculty of Mashhad University of Medical Sciences about the hidden curriculum. Through open interviews, students were asked about their understanding of the hidden curriculum, learning experiences from the hidden curriculum, and the hidden curriculum resources. The results showed that students considered the hidden curriculum more important than formal and explicit curriculum and believed that this curriculum caused more stable behaviors in them and ultimately led to positive learning such as professional ethics, work conscience, critical thinking as well as negative learning such as wrong and regular performance and hypofunction (18). Taghva'ei Yazdeli et al. in their research entitled "The relationship between the hidden curriculum and emotional intelligence of students of Kashan Medical Sciences University," concluded that the hidden curriculum has a significant impact on students' emotional intelligence and lack of attention to the hidden curriculum is one of the barriers to professionalism (19).

Mohammadi Mehr and Fathi Vajargah studied the position of the hidden curriculum in continuing medical education. They concluded that in clinical skills training, during continuing medical education programs, there are opportunities to consider and pay attention to the hidden and apparent effects on useful and educational content for physicians that through dialogue and negotiations and meetings in continuing medical education, we can advance the findings and awareness of physicians (20).

Lempp et al. researched 36 medical students to determine their views on the quality of the type of education they receive through the

hidden curriculum. The results indicated that students pointed to positive cases such as influential role models and availability of professors, as well as negative cases such as the existence of hierarchical and competitive atmosphere and stoic education and teaching in a humiliating manner, especially during clinical, educational years in this medical university (21). Fallah et al. investigated the role of the hidden curriculum components in high school students' learning. Their research concluded that school rules and regulations, interpersonal relationships, and teacher-student interactions are influential factors and components in students' learning (22). Samiee Zafarhandi examined the relationship between the hidden curriculum components (teachers' interaction with students, school rules and regulations, teachers' teaching methods, and evaluation methods) with students' emotional intelligence. Findings showed that among the studied components of the hidden curriculum except for school rules and regulations, other components of teachers' teaching methods, teacher evaluation, and teachers' interaction with students had a positive and significant relationship with students' emotional intelligence (23).

Amini et al. conducted a study entitled "Reviewing and explaining the hidden curriculum from the viewpoints of students of Kashan Medical Sciences University". Findings showed that three variables, namely physical space and environment, behavioral and personality traits of faculties, and their evaluation methods have the highest mean. Thus, these three variables have hidden and unexpected effects, and consequently, they have negative and desirable influences on the behaviors and students' learning (24).

Abroampa investigated the extent to which the hidden curriculum can help the students develop their skills, values, and affective attitudes. The results indicated that the students learned more in the classroom than teachers taught, and they never forgot what they learned from the school's setting (25). Cubukcu stated that in teaching values, the hidden curriculum is more effective than the explicit (formal) curriculum.

Therefore, the hidden curriculum and supportive activities on gaining values within character education in primary schools are important. Finally, it is determined that the hidden curriculum and the supportive activities

have great importance in internalizing and gaining values (26). Therefore, the present study aimed to identify the impact of the hidden curriculum components on students' cognitive attitude towards the content and organization of high school textbooks, as well as its impact on the teachers' methods of teaching and evaluation from public, non-public, and exceptional talent (SAMPAD) high schools.

Materials and Methods

This research was approved by Hormozgan University (Ethics ID NO- 1538393). The research method was a mixed method using a cross-sectional survey in the quantitative section.

In addition, a case study (phenomenological research of lived experience type) was used qualitatively. The statistical population consisted of all male students in high schools of District 1 of Bandar Abbas city in the Academic Year 2019-2020. According to Morgan's table, 277 subjects were selected using the cluster random sampling method.

Out of all secondary levels of high schools for boys in Bandar Abbas, seven high schools were selected, including three public high schools (138 students), three non-public high schools (76 students), and one exceptional talent high school (63 students). Inclusion criteria included being student in 10th, 11th, and 12th-grade of high school, and commitment to attend all sessions. Exclusion criteria included having a specific physical or mental illness, absence from sessions, and unwillingness to continue participating in the study.

This study was performed in two phases. The cases were asked to respond to both questionnaires in the first phase. In order to ensure confidentiality and reduce the effects of response bias, participants were provided with a cover letter that had a written description of the purpose of the study. In addition, they were informed that participation in the study was voluntary, and their responses would not be personally identifiable. In the second phase, the researcher interviewed participants to ascertain their perceptions of the emphasis on the characteristics of the hidden curriculum.

The researcher used an open-ended interview schedule. The purpose of the non-directive questions was to allow the participants to open a wide range of discussion topics and avoid leading them in their responses. The interviews were conducted and held in an office or the

library of the schools and were usually from thirty-five to forty minutes in length.

Research instruments

A) *Hidden Curriculum Questionnaire*: It consists of 80 closed-ended items developed by Sheikhei (27). It included five dimensions of the hidden curriculum components such as "teachers' interactions with students", "staff's interactions with students", "the content of the textbooks", "methods of teaching and teachers' evaluation," and "physical facilities". It is scored on a five-degree Likert scale (very high, high, medium, low, and very low) so that "very high" gets 5, and "very low" gets 1. Fifteen experts approved the validity of this questionnaire of Tehran University, Shiraz University, and Hormozgan University. The Cronbach's Alpha coefficient for the whole sample was 0.87. In this study, the Cronbach's Alpha coefficients of internal consistency of these five dimensions (sub-scales) were calculated as 0.86 for the "teachers' interaction with students" sub-scale, 0.84 for "staff's interactions with students" sub-scale, 0.85 for "the content of the textbooks" sub-scale, 0.85 for "methods of teaching and teachers' evaluation" sub-scale, 0.82 for "physical facilities" sub-scale, respectively. Samiee Zafarghandi obtained the Cronbach's Alpha coefficient of this questionnaire equal to 0.85 (23).

B) *Cognitive Characteristics of Learning Questionnaire*: This questionnaire consists of 35 closed-ended items developed by Mesrabadi (28). It included three dimensions of the cognitive characteristics of learning such as "The content of high schools' textbooks", "the

organization of high schools' textbooks", and "methods of teaching and teachers' evaluation". It consists of five Likert items represented on a 5-point continuum (1= completely disagree to 5= completely agree). Twenty experts approved the validity of Tabriz University, Tehran University, Isfahan University, and Shiraz University.

The Cronbach's Alpha coefficient for the whole sample was 0.79. In this study, the Cronbach's Alpha coefficients of internal consistency of these three dimensions (sub-scales) were calculated as 0.76 for "the content of high schools' textbooks" sub-scale, 0.80 for "the organization of high schools' textbooks" sub-scale, and 0.78 for "methods of teaching and teachers' evaluation" sub-scale, respectively. Fallah calculated the Cronbach's Alpha coefficient of this questionnaire 0.76 (22). After administrating the questionnaires, the SPSS software was used to perform various statistical computations and data analysis.

Results

According to the demographic population of this study, 277 male students completed the questionnaires. The participants were aged 15-18 years. Among them, 28 percents had parents with elementary education, 41 percents of the parents had high school diploma education, and 31 percents of the parents had Bachelor's degrees or higher degrees of education. Structural equation analysis was used to investigate the impact of the hidden curriculum components on the cognitive characteristics of learning. The studied model and the indicators related to the model fit are presented below.

Table 1. Model of fit indices

Fit Index	Acceptable domain	Observed value	Fit index valuation
Df/χ^2	< 0.3	2.38	Appropriate
IFI	> 0.9	0.97	Appropriate
RFI	> 0.9	0.95	Appropriate
RMSEA	< 0.8	0.69	Appropriate
SRMR	< 0.8	0.63	Appropriate
CFI	> 0.9	0.97	Appropriate
NFI	> 0.9	0.96	Appropriate

Table 1 presents the fitness indices of the model, which confirm the appropriateness of the model with the results of the research. The degree of freedom for the Chi-square ratio confirmed the fitness of the model Df/χ^2 , which

was less than 3, and means that the model fits the data. Furthermore, the Root Mean Square Error of Approximation (RMSEA) was 0.069, and the Root Mean Square Residual (SRMR) was 0.063, which was less than the criterion

(0.08), thus confirming the fitness of the model. Finally, IFI, CFI, NFI, and RFI indices were more significant than the desired criterion (0.9).

In general, considering the total calculated fit indices, the fitness of the structural model was confirmed.

Table 2. Path coefficient of the relationship between hidden curriculum components and the cognitive characteristics of learning

Path	Standard coefficient	Statistics (T)	P
Hidden curriculum Cognitive characteristics of learning	0.67	11.21	0.01

According to the results in Table 2, the standard coefficient value equals 0.67, and the test statistics value is more significant than 1.96. Therefore, considering the small significance level obtained from the value of 0.01. So, the relationship between the

components of the hidden curriculum and the cognitive characteristics of students' learning is confirmed. We used the multiple regression to investigate the relationship between the hidden curriculum components on students' cognitive characteristics of learning.

Table 3. Results of analysis of variance

Level of significance	F	Mean squares	Degree of freedom	Sum of squares
Regression	13.199	35.185	12	3662.223
Residues		23.121	264	6104.044
Total			276	9766.267

Based on the results of Table 3, the obtained F value is 13.199, which is significant at the alpha level less than 0.01, which shows that hidden curriculum components can explain the changes in students' cognitive attitudes toward the teachers' methods of teaching and evaluation of learning and shows the suitability of the proposed regression model. Furthermore, considering that the value of tolerance statistic is greater than the shear value of 0 (1.0) and the statistic of Variance Inflation Factor (VIF) is less than the shear value (10), it is concluded that the collinearity assumption has not been

violated. The results of multiple regression analysis have confirmed the impact of the hidden curriculum components on cognitive characteristics of learning in public, non-public and exceptional talents (SAMPAD) high schools.

The Multivariate Analysis of Variance (MANOVA) test was utilized to compare the hidden curriculum components among students of public, non-public and exceptional talents (SAMPAD) high schools. The results of this test, along with the study of its assumptions, were presented below (Table 4).

Table 4. Statistical description of the scores of the hidden curriculum components in public, non-public, and exceptional talent high schools

Statistical index	Public		Non-public		Exceptional talents	
	Mean	SD	Mean	SD	Mean	SD
Teachers' interaction with students	51.69	9.161	56.18	8.926	82.34	8.775
Staff's interactions with students	21.43	4.761	58.75	7.828	76.72	7.129
The content of textbooks	22.22	4.359	23.49	4.474	38.34	6.491
Methods of teaching and teachers' evaluation	52.48	9.229	62.21	10.977	78.00	11.955
Physical facilities	55.15	10.34	70.09	12.14	79.88	12.881

The Bonferroni post hoc test was applied to compare the differences between the scores of the hidden curriculum components in students

of public, non-public, and exceptional talents (SAMPAD) schools. The results showed that the mean scores of the teachers' interactions

with students in exceptional talents (SAMPAD) high school (82.34) are significantly higher than the mean scores in public (51.69) and non-public (56.18) high schools ($P < 0.05$).

The mean scores of the methods of teaching and teachers' evaluation of exceptional talents (SAMPAD) high school (78.00) are significantly higher than the mean scores in

public (52.48) and non-public (62.21) high schools ($P < 0.05$). Likewise, the mean scores of physical environments and facilities in exceptional talents (SAMPAD) high school (79.88) are considerably higher than the mean scores in public (55.15) and non-public (70.93) high schools ($P < 0.05$). Other pairwise comparisons were not significant ($P < 0.05$).

Table 5. Statistical description of the scores of the cognitive characteristics of learning of public, non-public, and exceptional talent high schools

Statistical index	Public		Non-public		Exceptional talents	
	Mean	SD	Mean	SD	Mean	SD
The content of high schools' textbooks	53.44	13.128	58.44	14.215	69.56	15.554
The organization of high schools' textbooks	57.69	14.635	67.45	15.121	77.45	16.687
Methods of teaching and teachers' evaluation	54.65	13.456	65.23	14.655	73.63	16.815

The Bonferroni post hoc test was applied to compare the differences between the cognitive characteristics of learning scores in students of public, non-public, and exceptional talents (SAMPAD) high schools. Based on the results, the mean scores of the content of high schools' textbooks in exceptional talents (SAMPAD) high school (69.56) are significantly higher than the mean scores in public (53.44) and non-public (58.44) high schools ($P < 0.05$). The mean scores of the organization of high schools' textbooks in exceptional talents (SAMPAD) high school (77.45) are significantly higher than the mean scores in public (57.69) and non-public (67.45) high schools ($P < 0.05$). The mean scores of methods of teaching and teachers' evaluation in exceptional talents (SAMPAD) high school (73.63) are significantly higher than the mean scores in public (54.65) and non-public (65.23) high schools ($P < 0.05$).

Discussion

The study aimed to investigate the impact of the hidden curriculum components on the cognitive characteristics of learning in public, non-public, and exceptional talents (SAMPAD) high schools. Cognitive characteristics of learning included the students' attitudes toward the subjects, textbooks, school and teaching methods, and teachers' evaluations. Given the findings, the total fit indices via structural equation modeling indicated acceptable goodness of fit in the model. This research was conducted in two sections: quantitative and qualitative. Results indicated that the independent variable (the hidden curriculum

components) positively correlated to all three dependent variables (students' cognitive attitudes toward subjects, textbooks, school and teaching methods, and teachers' evaluation). Overall, students' attitudes toward subjects, textbooks, school, and methods of teaching and teachers' evaluation were positive. In order to compare the differences between the scores of the hidden curriculum components in different high schools, the quantitative findings showed that the mean scores of most components in exceptional talents (SAMPAD) high school are significantly higher than the mean scores in Public and Non-Public high schools.

Based on the results, it can be concluded that the hidden curriculum has a positive and significant relationship with the cognitive attitudes of students' learning. Based on the qualitative findings, the textbook content directly and significantly correlates with the cognitive attitudes of students' learning. In Public high schools where students showed less interest in the content of the textbook, the researchers observed their negative attitudes toward the subjects and textbooks. However, in Exceptional talents (SAMPAD) and Hormozgan University High school (non-public), students' attitudes towards the content of the textbook were positive. Given the significant relationship between "the hidden curriculum" and "cognitive attitudes of students' learning" in the present study, the results were consistent with the findings of Kian et al., Abbaspour et al., Samiee Zafarghandi, Clinton, and Ludwig et al. (17,18,23, 30,32). According to the research of Ludwig et al., cognitive engagement with the

content is more effective than other learning techniques, and student's academic performance and achievement increase when they are interested in the curriculum (32). In explaining these findings, it can be said that the hidden curriculum, by completing many aspects of the educational identities of students, can provide rich educational opportunities and contexts for them to promote their cognitive attitude in learning. However, the qualitative findings showed that teachers' teaching methods in many high schools were unsatisfactory. According to the analysis, teachers' teaching and evaluation methods in the exceptional talents (SAMPAD) high school were more desirable than all schools, and in the public high schools were weaker. In most schools, the researchers observed the traditional teaching methods, memorization, and repetition of the curriculum. They did not use the teaching and evaluation methods proposed by theorists in educational psychology and learning in academic situations. The results of the study were consistent with studies conducted by Amini et al., Taghva'ei Yazdeli et al., Fallah et al., Abroampa, Cubukcu, Van Den Beemt et al. and Mulder et al. (19,22,24-26,33,34).

Van Den Beemt et al. argued that a better teaching method leads to more learning and academic achievement and develops a more positive attitude towards subjects, textbooks, and schools, thereby increasing students' academic self-concept (33).

Research findings on the content and organization of the textbooks showed that outdated content, its inconsistency with students' real needs, and the lack of a horizontal or vertical connection between content and subject matters are the main issues and concerns unresolved. It is suggested that education administrators and planners consider the practical components of the hidden curriculum identified in this study and introduce the concept by conducting in-service training courses for teachers and school staff. To reduce the negative consequences of the hidden curriculum, school administrators should consider students' psychological characteristics, individual differences, and psychological needs in curriculum design. Furthermore, parents should be encouraged to actively participate in their children's education to strengthen an effective relationship between them and the school at the sociological level. Parent presence as a partner at school will help

their children develop positive cognitive and emotional attitudes, leading to increased academic achievement, and consequently, reduced destructive impacts of the hidden curriculum. This research is considered important from two aspects, namely theoretical foundations, and practical foundations. In terms of theoretical foundations, the proposed model was adopted from the theories of learning, management, and curriculum design and planning. Scrutinizing the results of this research can serve as an educational tool for those involved in education. In this way, they will know that the desired and approved goals of the education system can be achieved only by modifying the curriculum.

The present research has some limitations that affect the generalizability of the results. However, some factors may have been out of the researchers' control which has caused some limitations in the research. First, the results of this study are limited to male high school students, and it is neither appropriate nor recommended to the students of other levels such as primary or middle schools and the second limitation is the geographical diversity of the participants, so the findings and the results should be generalized.

Conclusion

In general, the results of this study indicated the impact of the hidden curriculum components on students' cognitive attitudes toward the content and organization of high school textbooks and the teachers' teaching and evaluation methods, as well as the significant correlation between them. Therefore, we can find solutions to reduce adverse effects and design curriculum with more desirable quality. According to the findings, among the factors involved in developing the hidden curriculum in teaching methods and evaluation of teachers with destructive and anti-educational effects are the ancient knowledge of teachers due to having multiple jobs. This has caused a lack of motivation to keep in touch with students.

As a result, teachers consider students as learners instead of knowledge seekers. Teachers are influenced by this dominant mentality and emotional view that they can solve the students' problems by granting good marks.

Therefore, it is suggested to help teachers not think of themselves as mere transmitters of knowledge and textbooks content by adopting

various methods to change attitudes and improve their profession's level of knowledge and skills. Instead, they should be reminded that they play a more inclusive role as facilitators and guides, meeting the needs of the audience and students.

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