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An Examination of Instructional Autonomy Practices of Science Teachers*

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Abstract: Contemporary studies related to teacher autonomy mostly deal with research into how autonomy is perceived by teachers and which variables it is associated with. On the other hand, there are very few studies dealing with how teachers' instructional autonomy over the curriculum is reflected in the education process. The aim of this study is to reveal in depth the practices carried out in the context of instructional autonomy by science teachers who have different levels of autonomy. The study is based on data gathered from eight teachers employed at different schools in the province of Izmir in Turkey. Interviews, observations and documents were used for collecting the data. The results reveal that while teachers with high instructional autonomy successfully apply contemporary teaching methods, alternative evaluation techniques, high-order thinking skills and effective classroom management, teachers with low instructional autonomy fall short in all of these areas.

Keywords: *Curriculum autonomy, instructional autonomy, science teachers, Turkey.*

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Introduction

The concept of autonomy became a topic of discussion especially during the 20-25-year period after the Second World War, and it was frequently the subject of educational research towards the end of the 20th century (Little, 1999). There are numerous studies in which the autonomy concept is discussed in relation with the student, teacher and school dimensions (Bustingorry, 2008; Chan, 2001; Cotterall, 1995; Dickinson, 1995; Ingersoll, 2007; Little, 1995; Littlewood, 1996). It is seen that these studies concentrate on "school and learner autonomy (Little, 1995; Öztürk, 2011), whereas in the last 20 years, the number of studies related to teacher autonomy has increased (Benson, 2010; Benson & Huang, 2008; Burkert & Schwienhorst, 2008; Cakir & Balcikanli, 2012; Dikilitas & Mumford, 2019; Ding, 2009; Dymoke & Harrison, 2006; Hong & Youngs, 2016; Nguyen & Walkinshaw, 2018).

Studies related to teacher autonomy have an important place in the development of educational environments (Brunetti, 2001; Friedman, 1999; Kuku & Taylor 2002; Pearson & Hall, 1993; Pearson & Moomaw, 2005). An environment that enables teachers to make their own decisions and implement these decisions freely will improve the quality of educational services (Öztürk, 2011). In such an environment, it is very important for varied and productive practices to be carried out for an effective teaching process. However, the way that teacher autonomy translates into practice and benefits teacher development is a subject that is seldom examined (Lamb & Reinders, 2007; Little, 1995; Xu, 2015). Yet the question of whether teachers' possession of low or high levels of autonomy makes a difference to the practices that they carry out in the process is an important one.

It is seen that the literature related to teacher autonomy concentrates on conceptualisation studies (Friedman, 1999; Öztürk, 2011; Pearson & Hall, 1993), correlational studies in which relationships are revealed in terms of various variables (Edgar & Warren, 1969; Koustelios et. al., 2004; Kuku & Taylor, 2002; Pearson & Moomaw, 2005), and qualitative studies based on interview data (Cakır & Balcikanli, 2012; Dikilitas & Mumford, 2019; Ding, 2009; Dymoke & Harrison, 2006; Hong & Youngs, 2016). The literature is yet to develop an in-depth understanding of science teachers' autonomy through multiple sources of qualitative evidence, such as document analysis, interviews as well as

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observations. This situation makes it difficult to fully understand how instructional autonomy is reflected in real learning environments. Determining how teacher autonomy is reflected in practice will contribute to a better understanding of instructional autonomy and to organising teacher training policies in such a way as to support teacher autonomy. The aim of this study is to attempt to reveal in depth the practices and ideas of science teachers with different levels of autonomy in the curriculum implementation process.

In line with the aim of the research, I explore the following research questions:

Research Question 1: What do teachers with different perceptions of autonomy regarding the curriculum think about their practices?

Research Question 2: What are the practices of teachers with different perceptions of autonomy regarding the curriculum?

The importance of this study stems from the fact that it enables a better understanding of how teachers' levels of instructional autonomy contribute to the organisation of learning environments. Depth is added to the data collection process of this study by observations made in real classroom environments together with interviews and document analysis. In this way, it is expected that this study will contribute to filling a gap in the literature related to the functioning of instructional autonomy in practice by revealing how instructional autonomy is reflected in different processes from method-technique to content selection and from classroom management to the assessment process. Revealing that teachers with similar levels of autonomy carry out parallel practices in the learning process will be shown as evidence of the power of instructional autonomy to affect teachers' practices.

Autonomy in the Context of the Turkish Education System

The Turkish education system has a centralised structure which requires that the same curriculum is applied in regions that have significant differences culturally, economically and geographically (Şişman & Turan, 2003). As a natural result of this situation, the outcomes and contents of teaching programmes are determined centrally. School-based curriculum development practices are considerably inadequate (Kahramanoğlu, 2017). At the turn of the 21st century, a student-centred and constructivist approach was reflected in programmes, and teachers were given the opportunity to carry out flexible practices for organising and evaluating the teaching process. Despite this, the system for entry into high school and university is based on a traditional central exam implemented all over the country (Birinci, 2014; Büyüköztürk, 2016).

The centralised structure of the Turkish education system and the inadequacy of school-based practices limit teachers' autonomy in making decisions. Central exams are also an important variable limiting teacher autonomy (Arslan-Şakar, 2013; Organisation for Economic Co-operation and Development [OECD], 2010; Öksüz-Gül, 2015; Sachs, 2000). On the other hand, the curricula support teachers' instructional autonomy in selecting and implementing teaching and assessment activities. In this case, it is considered important to reveal what kind of differences in the teaching process are exhibited by teachers with different levels of autonomy while implementing the same programme. In this way, decision makers in countries applying centralised curricula in a similar context can gain more ideas about teachers' curriculum autonomy.

Theoretical Framework

Teacher Autonomy

Autonomy is defined as an individual's having a say in actions and choices that direct his/her own life (Littlewood, 1996; Oğuzkan, 1974; Oshana, 2003). Autonomy is a person's ability to make decisions regarding his/her own behaviours and to be independent of external effects when making these decisions. Accordingly, autonomy can be said to have two important dimensions, namely "being aware of one's own wishes" and "sensing that one has the right to choose" (Deci & Ryan, 2000). An individual with a high level of autonomy works independently, initiates new activities, and in order to adapt these to changing conditions, makes changes to existing situations. On the other hand, an individual with a low level of autonomy cannot make independent decisions and only makes decisions in technical issues that do not affect the basic principles or procedures of the business (Friedman, 1999).

In the field of education, the concept of autonomy is examined under different headings such as organisational autonomy, autonomy in teaching, learner autonomy and school autonomy. Although these topics include the basic components of autonomy (independence, freedom in decision making, power of control, etc.), they have significant differences in terms of structure.

Teacher autonomy includes teachers' possessing the ability to control themselves and the learning environment, to take independent actions by freeing themselves from external control and pressure, and to plan the learning process and make their own decisions in educational issues (Benson, 2010, Benson & Huang; 2008; Edgar & Warren, 1969; Ingersoll, 1997; Little; 1995; Pearson & Moomaw, 2005). In short, teacher autonomy expresses a teacher's having a wide field of activity in the classroom and being independent of external influences (Hacker & Barkhuizen 2008;

Vangrieken et al., 2017). Contemporary discussions on teaching mention the need to increase teacher autonomy (Bull, 1988).

Teachers' Curriculum Autonomy

A more specific dimension of teacher autonomy is curriculum autonomy. Since teachers' area of classroom decisions is very wide, it is important to reveal the different aspects of curriculum autonomy (Vangrieken et al., 2017). While the content aspect of curriculum autonomy includes making decisions related to the curriculum, selecting the subjects and skills to be taught, choosing the teaching materials and course books, determining the objectives for students, and setting students' homework, the pedagogical aspect includes organising teaching plans, selecting teaching methods, and student evaluation (LaCoe, 2006; Pearson & Moomaw, 2005; Vangrieken et al., 2017). In this study, although both aspects of teachers' curriculum autonomy are discussed, due to the lack of a flexible approach for choosing subjects and course books in the country where the research is carried out, more emphasis is placed on pedagogical autonomy.

Teachers can exhibit their autonomy easily while planning and implementing instruction. The existing structure of schools induces teachers to work independently of external control in self-contained classes (Anderson, 1987). Although teaching programmes draw a specific framework for teachers, teachers are the sole authority in the classroom and they can implement the curriculum as they wish. Teachers can freely implement the decisions they make in many areas, such as selecting methods and techniques, using materials, determining the duration and place of activities, and choosing assessment methods.

Although there are researchers who state that participating in the curriculum development process is the first step in increasing instructional autonomy (Mackenzie, 2002), there are also researchers who argue that external control over the curriculum has a limited effect on teachers' instructional autonomy (LaCoe, 2006; Prichard & Moore, 2016). Teachers' ability to make changes to the curriculum is regarded as an important act of autonomy (Eurydice, 2008; Ingersoll, 2007; Friedman, 1999; Pearson & Hall, 1993). Curriculum autonomy encourages teachers to vary the programmes according to students' interests and needs (Skilbeck, 2005; Vieira, 2007). When teachers have curriculum autonomy, they feel a stronger commitment with regard to implementation (Garrett, 1990; Kennedy, 1992). Programmes which are prepared in detail and are difficult to implement, however, restrict teachers' individual autonomy (Helgoy & Homme, 2007).

In cases where researchers are especially concerned with teachers' roles in non-traditional teaching and learning environments, they are more concerned with basic characteristics which will allow teachers pedagogical autonomy (Benson & Huang, 2008). When autonomous teachers have control over instruction, they develop analytical and reflective strategies for the learning process, they do not remain limited to the framework formed by the curriculum, and they apply different instructional activities effectively. Teachers regard themselves as a competent authority, and their direction of the learning process with their own decisions and creation of personalised rules in class are an indicator of their autonomy (Franklin, 1988). Teachers' determination of work methods and resources, and their consideration of in-class practices and lesson planning, are associated with their autonomy (Burkert & Schwienhorst, 2008).

Teacher autonomy is also related to professional development activities (Manzano-Vázquez, 2018). The fact that teachers feel they are directing their own actions and developing themselves reveals that they are autonomous (Lamb & Reinder, 2007). Responsibility, being aware of needs, motivation, critical thinking, self-assessment and a certain amount of freedom are also factors necessary for autonomy (Huang, 2005; Ramos, 2006). Teachers who are really successful are always autonomous in terms of having a powerful sense of personal responsibility (Little, 1995).

Teachers' curriculum autonomy is very important with respect to its effect on both achievement and learner autonomy. Autonomous teacher activities are shown to be a significant predictor of learning outcomes (Caprara et al., 2006; Moore & Esselman, 1992). Moreover, teachers' displaying of autonomous behaviours develops student autonomy (Benson & Huang, 2008; Burkert, 2010; Castle, 2006; Marcosa & Tillemab, 2006). These benefits of teacher autonomy for students are more closely associated with teachers' competences in autonomy over the curriculum.

Factors Limiting Teacher Autonomy

If instruction is carried out in a bureaucratic environment where there are rules and a routine supervision system, this limits teacher autonomy (Edgar & Warren, 1969). According to Benson (2010), supervision of teachers, parents' complaints and authoritarian management have negative effects on autonomy. Moreover, when teachers have to allocate a lot of time to procedural paperwork, this is another factor that limits their autonomy.

Focus on statistical data in education and standardisation movements also weaken autonomy (Sahlberg, 2007). Anderson (1987) suggested that there are three factors leading to a decrease in teacher autonomy: government-supported standardised professional development programmes for teachers, teacher assessment with compulsory classroom observations, and school managers' adoption of a "teachers' leader" role. When examining teachers' autonomy in the implementation process, awareness of the factors limiting autonomy is important.

Method

In this study, a case study type of qualitative research design is adopted. The case study, which presents one or more than one case by means of data collection tools such as observation, interviews, documents, or audio-visual materials (Creswell, 2012), can be defined as a research method that examines a contemporary phenomenon within its own natural real-life context, and is used in cases where the boundaries between the phenomenon and context are not clearly defined (Yin, 2003). Since the focus of the gathered data was teachers' experiences, this study was appropriate for a case study on instructional autonomy. This followed an explanatory case study model that linked the theoretical ideas behind instructional autonomy to teachers' experiences. The explanatory case study enables a universal understanding of the processes and characteristics of a case in real life (Yin, 2014). The design of explanatory case studies is comparative, and allows for analysis of a single phenomenon from multiple perspectives. In terms of a better understanding of how instructional autonomy is reflected in practice in the review of the literature, the explanatory case study approach is described as an appropriate method to explain from a multiple perspective how instructional autonomy is implemented by teachers with different levels of autonomy. This explanatory case study was used to explain the connection between instructional autonomy and teachers' practices.

The research process was conducted by detailed planning. First of all, the literature was reviewed for teacher autonomy. This was followed by a literature review focusing on instructional autonomy, and the conceptual framework of instructional autonomy was defined. The problems and subproblems were determined by focusing on the gaps in the literature. By specifying teachers with different levels of autonomy as the unit of analysis, a multiple case study design was used. In a multiple case study design, each case is discussed in its own right and then the cases are compared with each other (Yin, 2003). An instructional autonomy scale, which was developed by taking the conceptual structure into account in accordance with this design, and whose validity and reliability were confirmed by the analyses that were made, was used to determine teachers' levels of autonomy. According to the scores obtained from this scale, teachers displaying low autonomy and high autonomy were determined. The qualitative research process was conducted through these teachers. To determine the teachers' instructional autonomy experiences, an interview and observation form, whose details are explained below, was developed. The data were collected with these forms, and these data were subjected to content analysis in order to determine the themes and categories. The findings were discussed by evaluating the analysis results and literature review together.

Participants

The participants of the research consist of eight science teachers employed in secondary schools located in the province of Izmir. The criterion sampling technique, one of the purposive sampling methods, was adopted at the stage of determining the participants. The criterion used as the basis for determining the participants was that they had different perceptions of autonomy. To determine the participants' perceived autonomy, the Curriculum Autonomy Scale (CAS), whose validity and reliability were verified and which was developed for this research, was utilised.

The Curriculum Autonomy Scale (CAS) consists of 13 items and four mutually supportive subdimensions. These subdimensions are the dimensions of professional development, and planning, implementation, and evaluation of the instruction process. The items that comprise the dimensions are considered to be compatible with the dimensions of instructional autonomy in scales related to autonomy in the literature (Friedman, 1999; Ulaş & Aksu, 2015; Pearson & Hall, 1993). Therefore, it was determined that the CAS would measure perceptions of instructional autonomy in a valid and reliable way.

According to the scores obtained from the CAS for the interview process, it was determined that three teachers had a high level of autonomy, two had a moderate level and three had a low level (Table 1). The in-class observation process was conducted with six teachers with high and low levels of autonomy from among the teachers interviewed (Table 1). The aim in conducting the observation process with teachers who displayed significant differences in their perceived autonomy was the idea of revealing more distinct differences in implementation.

Table 1: Demographic and autonomy information about participants (Interview/Observation)

Teacher	Gender	Professional Seniority	Department Graduated from	Type of School Employed at	Socio-Economic Level of School	Technique Applied	Level of Autonomy
T1	E	6-10 years	Education Faculty	Public	Low	Interview/ Observation	Low ($\bar{X}$=2.59)
T2	E	30-35 years	Education Faculty	Private	High	Interview/ Observation	High ($\bar{X}$=4.19)
T3	K	0-5 years	Education Faculty	Public	Medium	Interview/ Observation	Low ($\bar{X}$=2.55)
T4	K	16-20 years	Science Faculty (Physics)	Public	Medium	Interview/ Observation	Low ($\bar{X}$=2.50)
T5	E	11-15 years	Education Faculty	Public	Medium	Interview/ Observation	High ($\bar{X}$=4.16)
T6	E	11-15 years	Education Faculty	Public	Medium	Interview	Moderate ($\bar{X}$=3.20)
T7	E	11-15 years	Education Faculty	Public	Medium	Interview/ Observation	High ($\bar{X}$=4.00)
T8	K	11-15 years	Education Faculty	Private	High	Interview	Moderate ($\bar{X}$=3.10)

Data Collection

Data gathered with the interview, observation and document analysis techniques during the research were analysed and interpreted.

Interview Process

Interviews were conducted to reveal teachers' opinions about their autonomous actions during curriculum implementation and to determine the practices that they carried out. A semi-structured interview form was created by the researcher and two domain experts. While the interview form was being prepared, attention was given to making the questions easily understandable, avoiding orientation, including focused questions, following a logical order of questions and asking open-ended questions. During implementation, first of all, to determine problems that might occur during the interviews, pilot interviews were carried out with two teachers who were not participants in the actual study. Following the pilot interviews, changes were made to a few questions that were difficult to understand.

The teachers to be interviewed were first contacted by telephone, the general content of the interviews was mentioned, and suitable time periods were determined. During these time periods, the teachers were met and the interviews, each of which lasted 25-35 minutes, were conducted. Participants were informed that their interviews would be recorded with a sound recorder and that these recordings would be analysed in a computer environment. The researcher stressed that in accordance with ethical principles, the data obtained from the interviews would be used only during the research and that these recordings would not be accessed by any other person. In line with these explanations, the participants consented to have their interviews recorded. Care was taken to ensure that the interviews were conducted in an intimate and comfortable environment. In the interviews, an attempt was made to obtain in-depth data with "probe" questions in addition to the interview questions. At the end of the interviews, teachers were asked to state any views they wished to add, if they had any, and notes were taken accordingly. Moreover, various notes were taken about the teachers' body language, in the belief that this would enrich the interviews. The names of teachers who took part in the interviews were kept confidential by giving each of them a code (T1, T2, T3, etc.). After all the interviews were completed, the sound recordings of the interviews were transcribed in a computer environment.

Observation Process

In the study, the observation process concerned how the teachers conducted their in-class activities and shaped the content. An observation form was developed to be used in the observation process. In this form, sections related to student- and teacher-centred activities, classroom management, time management, content organisation and the evaluation process are included. Prior to the actual implementation, a trial implementation was conducted with the observation form in the lessons of two teachers who were not among the participants of this research. Following this implementation, in addition to the existing sections in the form, the sections of high-order thinking skills and out-of-class activities were added. The observation process was carried out in person by the researcher with 6 teachers from among the interviewed teachers who showed distinct differences in autonomy levels (low autonomy and high

autonomy). In-class observation was carried out with each of the teachers for a total of 8 lesson periods over a period of 4 weeks, with 2 lesson periods (40+40 min) per week. Detailed notes were taken by using key words for the sections included in the observation form, and situations that were unpredictable and therefore not included in the form were noted separately. Since the times when the teachers were available varied, the class levels and units observed also differed (Table 2)

Table 2: Information related to Observation Process

Teacher	Gender	Level of Autonomy	Class Level-Unit Observed	Observation Period	Date
T1	M	Low ($\bar{X}$=2.59)	6th Grade-Systems	8 class hours (4 weeks)	4-29 March
T2	M	High ($\bar{X}$=4.19)	8th Grade- Electricity	8 class hours (4 weeks)	4-29 March
T3	F	Low ($\bar{X}$=2.55)	7th Grade-Energy	8 class hours (4 weeks)	4-29 March
T4	F	Low ($\bar{X}$=2.50)	7th Grade- Energy	8 class hours (4 weeks)	1-26 April
T5	M	High ($\bar{X}$=4.16)	5th Grade-Light	8 class hours (4 weeks)	1-26 April
T7	M	High ($\bar{X}$=4.00)	6th Grade - Sound	8 class hours (4 weeks)	1-26 April

The lesson observations were carried out on basic areas of the teaching profession, such as classroom management, instruction process, time management and content organisation. Detailed notes were taken related to activities and actions that occurred naturally during lessons.

Document Analysis Process

The books, workbooks, homework exercises, concept and mind maps, evaluation forms, student notebooks and electronic documents used by the teachers during implementation of the curriculum were examined. During examination of the documents, a checklist showing the presence or absence of an object was used. In the checklist, items such as originality, use of examples from daily life, high-order thinking skills like creative and critical thinking, giving traditional assignments, and giving contemporary assignments were included. By taking advantage of the fact that the number of documents was not great, each document was re-examined at two-week intervals, and it was seen that compatibility in the checklists was high. In this way, it was concluded that the data obtained from the documents were consistent, and these data were interpreted in relation to the themes that emerged in the interview and observation process.

Data Analysis

In this research, the steps of content analysis were followed. Content analysis includes preparing and organising the data for analysis, and then encoding the data and reducing them to themes by combining the codes (Creswell, 2018). Accordingly, the raw data that were obtained first were the 24-page observation notes, the 16-page interview recordings, and the 6-page checklist obtained from the documents. The encoding process was begun by reading all the raw data from beginning to end. After all the data had been encoded, data such as words, sentences and paragraphs that were mutually meaningful and related were combined under the same code, and the reduction process was begun. The reduced codes were then combined in such a way that they would be mutually meaningful and related. The combined codes were given a general heading and eight different subthemes were created. Following these processes, all data were reread and the data were placed under the subthemes created. After the data had been placed, four themes were created by giving headings to mutually meaningful and related subthemes (Table 3). The findings were discussed within the subthemes for each theme in terms of teachers with different levels of autonomy, and the comments made were reinforced by including direct quotations where it was considered necessary.

Validity and Reliability

To ensure internal validity (credibility) of the study, in-depth focused data collection, variation (interview + observation + document analysis) and expert examination criteria were used (Guba & Lincoln, 1985). For enabling external validity (transferability), care was taken to determine the participants using the criterion sampling type of purposive sampling technique (Yıldırım & Şimşek, 2011). Moreover, the determination of the participants, and the data collection and analysis process are described in detail (Shenton, 2004). With the aim of ensuring the internal reliability (consistency) of the research, examination of consistency was made by consulting the views of an expert on the raw data based on the interviews and the subthemes created as a result of the analysis (Miles & Huberman, 1994). Moreover, when using the observation and interview techniques, an attempt was made to increase consistency by presenting similar approaches during both the data collection and the creation of the codes and themes.

Findings

As a result of the analysis of the findings obtained through interview, observation and document analysis, various themes and subthemes emerged (Table 3). These themes and subthemes were analysed in detail.

Table 3: Themes and subthemes

Themes	Subthemes
Diversification of Instruction Process	Determining Methods/Techniques Organisation of Content
Diversification of Evaluation Process	Evaluation Techniques Originality of Evaluation Materials
Development of Thinking Skills	-
Classroom Management	Providing Discipline Ensuring Student Participation Seating Arrangements

Diversification of the Instruction Process

Determining Methods/Techniques

Use of teaching methods and techniques by teachers in their lessons is a requirement of their professional roles. In the evaluation of the interview data, teachers with low and medium perceptions of autonomy stated that they often used traditional approaches such as presentation, narration and teacher experiments. When the interview data were evaluated, it was determined that all the 3 teachers with low perceptions of autonomy and the 2 teachers with moderate perceptions of autonomy frequently used presentation, narration and teacher experimentation methods, which are traditional approaches. The data obtained from the observation form confirm that the teachers used these methods to a great extent in their lessons. When teachers with low perceptions of autonomy were asked why they tended towards these methods, they gave as reasons the fact that classes were crowded, that these methods gave them the chance to use the time more effectively, that they made classroom management easier and that they made it possible to answer more questions. The teachers stressed that when they used student-centred methods, order in the classroom was rapidly disturbed and that students were unable to learn in a chaotic classroom environment:

> "…It is not easy to keep control of the students. Our students are already adolescents. They become distracted very quickly. They are happy when we do different activities, but there is a chaotic atmosphere in class. Therefore, I can have problems keeping up with the topics. When we do narration, on the other hand, there is a disciplined atmosphere in class and I can finish the topics very easily." (T1)

Teachers with high perceptions of autonomy, however, stated that they frequently used educational games, drama, student experiments, instruction with music, case study, simulation and discovery methods. According to the observation data, in addition to these methods/techniques, the teachers also included inviting experts, analogies, video activities, and concept and mind map techniques. These teachers stated that although student-centred activities were time-consuming, they were necessary for effective education, and that they tried to reach all students with different learning styles by using varied methods. These teachers reported that although they sometimes used presentation and narration methods, the process was not dominated by these methods. These teachers stated that by including student-centred methods, they activated the students, increased their motivation and in this way, achieved permanent and meaningful learning:

> "I know that I have to vary the methods in order to enable permanent learning. Just as the structures of each topic differ from one another, students also have learning styles that are different from each other. Therefore, I have to use different methods and techniques. Students soon become bored with teacher-centred practices, whereas student-centred methods both make the students like the subject and result in effective learning." (T7)

It was seen that teachers with high perceived autonomy were very flexible in the enrichment process and carried out collaborative practices. For example, in the topic of "energy sources", which is related to the subjects of both Science and Geography, one teacher invited the Social Sciences teacher to class and they structured the topic together. Another teacher invited several high school students to class and created a discussion environment on the subject of "adolescence". With these activities, the teachers relieved the lesson process of monotony.

Organisation of Content

When organising content, teachers with low autonomy used traditional approaches such as focusing on description and examples, a book-centred approach, consolidation, and doing exercises. Teachers with high autonomy, however, included modern approaches when organising content, such as creativity, establishing relationships between subjects, associating subjects with daily life, and using learning strategies. These teachers' skills in establishing relationships between subjects were revealed during the observations:

> "A teacher (T5) stated that the letter "F", the symbol for force, came from the English word "force", thereby establishing a connection between the subjects of English and Science. Another teacher (T2), by stating that

> "Electricity is generated in dams. Large dams are located in the East Anatolia region where the geographic structure is suitable", established a connection between the subjects of Geography and Science."

It was determined that teachers with high autonomy frequently associated the subjects they taught with daily life. It was seen that when these relationships were established, both the teachers and the students were enthusiastic. During the document analysis process, it was determined that teachers often had students write examples from daily life in their notebooks. They also gave the students homework in which they could associate the subjects with daily life. It was seen that teachers with different levels of autonomy also organised content in different ways.

Diversification of the Evaluation Process

Evaluation Techniques

All of the teachers with low and medium levels of perceived autonomy mostly stated that they used traditional evaluation techniques consisting of worksheets, test books, experiments and conventional exams. When the data in the observation form were examined, it was determined that while these teachers were revealing students' learning deficiencies, they frequently included test books and worksheets, while for giving notes, they used traditional assessment techniques such as written, multiple choice and correct-incorrect methods. The teachers reported that their evaluations were made with the aim of preparing students for the central exams conducted over the whole country. It was revealed that the teachers' evaluation practices carried out for this reason applied not only to students in the central exam year but to students at all class levels. This situation displays the extent to which central exams dominate the assessment practices of teachers with low and moderate perceptions of instructional autonomy. These teachers stressed that making assessments with a different approach would not be realistic in a country where there are centralised examinations:

> "One of my most important duties as a teacher is to prepare students for the central exams, since these exams are essential for students on their road to careers in which they will earn their living. Therefore, I plan my evaluation process according to the format of the central exam. Because the central exams consist of multiple-choice tests, it is logical that I make my assessments based on question-solving and teaching test techniques." (T3)

Teachers with high perceived autonomy also included traditional methods such as worksheets and conventional exams. In parallel with the teachers with low perceptions of autonomy, they stated the existence of the central exams as the reason for this. However, they emphasised that traditional assessment techniques only measured students' memorisation and interpretation skills, and that therefore, they remained very limited. Moreover, they stated that student-centred activities like drama, simulation and case-study could not be evaluated with traditional techniques. The teachers declared that for these reasons, they aimed to assess different skills in students by including alternative evaluation approaches, thereby making a holistic assessment. When the data in the observation form were examined, these teachers often included contemporary assessment techniques such as performance evaluation, evaluation based on student presentations, self-assessment and authentic assessment. This situation is compatible with the interview data:

> "I consider that an assessment based only on worksheets or tests will not be sufficient. Although these are important for preparing for central exams, they are not successful for measuring different skills of students. For example, I believe that I measure my students' oratory skills when I have them do presentations, creativity skills when I have them do performance evaluations, and self-knowledge skills when I have them do self-assessments." (T5)

The situation where teachers displayed similar approaches in this theme appeared in the process of evaluating students' lesson participation behaviours. All the teachers assessed students' active participation in the lessons, their behaviours that affected the organisation of the lessons and whether or not they did their homework. The teachers stated that when they evaluated the students' participation, they did not look at the grades they obtained in exams, and gave marks based entirely on their observations in the process. They stated that in this way, their assessments would be fairer:

> "I assess the student's positive contributions in class. I do not evaluate the grades obtained in exams as an in-class activity. In the end, each student might not be able to demonstrate his/her true success at exam time. I aim to give a fair grade by considering the things that we do over the weeks." (T2)

Originality of Evaluation Materials

An important item of data is the fact that during the instruction process, the worksheets and exams used by teachers with low autonomy were not original ones prepared by themselves. For resources such as these, the teachers generally made copies from education sites on the internet or test books belonging to various publishers. Moreover, these teachers mostly preferred to give practice homework. The teachers made the ready-made materials that they obtained

suitable for their own students with small adaptations. When the data in the observation form were examined, teachers with high instructional autonomy, however, predominantly used original worksheets and questions that they prepared themselves. These teachers mostly stated that they aimed to develop students' research and inquiry skills by giving them research homework.

Development of Thinking Skills

It was observed that teachers with low perceived autonomy hardly ever included higher-order cognitive skills like creative, reflective or metacognitive thinking skills. In the document analysis, following examination of student notebooks, it was revealed that only grades appropriate to lower-order cognitive stages were obtained, which confirms the above case. According to the data obtained in the observation process, one reason for this situation is that these teachers, who frequently used teacher-centred methods, were unable to create an environment for developing higher-order cognitive skills. Another reason that emerged in the observation data for this situation is that the teachers lacked knowledge and skills related to how they could foster higher-order cognitive skills. It is seen that these teachers were in need of serious in-service training in this subject:

> "I do not know much about higher-order thinking skills, either. I am deficient in that subject. In my opinion, seminars related to these skills should be given." (T4). "I do not have a command of higher-order thinking skills, nor do I know much about how these skills can be developed." (T3)

Teachers with high perceptions of autonomy stated that they aimed to develop students' thinking skills by conducting activities such as inquiring about cause-and-effect relationships, using creative visuals, creating original designs, data collection and analysis, transferring things that are learnt to daily life, and self-evaluation. In the document analysis process, when the students' notebooks were examined, it was determined that numerous exercises supporting creative and critical thinking had been done. It is to be expected that these teachers, who utilise a number of different student-centred teaching methods, will also focus on higher-order cognitive skills. The teachers mainly learned ways to develop these skills via their own implementation experiences and by doing research in the literature. During the interviews, it was determined that these teachers made more efforts towards their own professional development:

> "I consider that developing higher-level thinking skills is one of the most important aims of education. The subject of science offers us a suitable climate for developing these skills. In the first years of my profession, I was deficient in these areas. However, since I knew the importance of thinking skills, I placed emphasis on this subject. I read articles, I observed the activities of teachers who were well informed in this area via the internet, and I improved myself by adding my own experiences. Now I believe that I have developed these skills without any difficulty." (T7)

Classroom Management

Providing Discipline

In this subtheme, it was determined that teachers displayed more parallel approaches compared to findings for the other themes. All of the teachers listed crowded classrooms, students entering a number of lessons one after the other and being tired, the continual emergence of out-of-class problems, and spending a lot of time on students who had behavioural problems as factors that made classroom management more difficult. Stating that despite all these disadvantages, they did not experience great difficulties in classroom management, all of the teachers reported that they could overcome many problems by strengthening communication with students:

> "I do not want students to be like household goods. I can even get through to students who have problems. I have good communication with the students. I sit with them in the canteen. I drink tea. We even assimilated, over time, a student who should have been expelled from the class. I have tried to communicate by talking. Even if they appears not to listen, it has an effect." (T2)

Ensuring Student Participation

Different practices in classroom management applied by teachers with different levels of autonomy emerged during students' participation in lessons. Teachers with low autonomy generally tended to involve willing students (who were generally the most successful students) in the lessons. In the interviews, it was determined that the teachers were not very aware of these tendencies, and that they displayed these behaviours involuntarily. The fact that these teachers involved only willing students in the lessons can be thought to be related to the teaching methods that they used. During the observations, the use of traditional methods focusing on cognitive learning resulted in quick learners continually coming to the fore. Even though teachers did not want it to be that way, they implicitly conducted the lessons on the basis of willing students. On the other hand, teachers with high autonomy were successful in ensuring that almost all students participated in the lessons. In the interviews, it was revealed that the teachers made a conscious effort to include all students in classes. These teachers did not attach importance to students' individual

differences, and conducted strategies that would enable each student's active participation in class. One observation note that can serve as an example of these strategies is as follows:

> "When the teacher asked a question, up to half the class put their hands up (the question was open-ended). Before the teacher (T7) took the answers, he used expressions to motivate students who were unwilling to take part in the lesson. He gave clues to a student, who was not so successful academically, that would make it easier for him to comment. At the same time, he encouraged the most successful students to think more deeply."

Seating Arrangements

Making the classroom seating arrangements also constitutes a dimension of classroom management. Teachers with low autonomy conducted their classes entirely with a traditional seating arrangement. As reasons for this, the teachers gave the fact that the classes were crowded and that it was easier to ensure discipline. Teachers with high autonomy, however, preferred to use seats arranged in groups and in the form of a U in addition to the traditional arrangement. This difference among teachers is considered to be related to their teaching methods. Desks arranged in rows are ideal for teachers with low autonomy who prefer narration and presentation methods. For methods such as simulation, case study, experiments and discussions, the use of different types of seating patterns is obligatory (for teachers with high levels of autonomy). One implementation that was made regarding a seating arrangement, despite all the adverse conditions, by a teacher with high autonomy, is a striking example that shows the effect of autonomy on classroom management:

> "My class is very crowded (about 50 students), and it is not always possible to organise the desks in the classroom in the way that I wish. Therefore, I take the students out into the schoolyard and I use each bench for a group where cooperation can take place. Sometimes we also do activities in the basketball court in the schoolyard, the children sitting in groups on cushions. Moreover, I use the school's conference hall for demonstration experiments, since it is not possible to form a U shape with the desks in the classroom. Yes, crowded classes are difficult, but as a teacher, I do not wish to resort to excuses." (T5)

Discussion

In terms of its power to affect teaching and learning, the concept of autonomy has become increasingly important in educational literature (Benson & Huang, 2008; Brockett & Hiemstra 1991; Candy, 1991). It is seen that the literature related to teacher autonomy is mostly concerned with teachers' participation in decision-making processes at school and their efforts to support student autonomy (Cheon et al., 2019; Parr et al., 2020). Although teachers' instructional autonomy was considered important (Aoki, 2002; Street & Licata, 1989), very little was known about how autonomy was reflected in in-class practices. This study has investigated what teachers with different levels of autonomy do, and what their ideas are, during curriculum implementation.

Considering that autonomy is in fact one of the innate psychological needs (Deci & Ryan, 2000), it is to be expected that all teachers will display different degrees of autonomous behaviour. In this respect, autonomy is not a static concept considered to be "all-or-nothing" (Meyers, 1986; Ramos, 2006; Wilches, 2007). In that case, the actual question is what kind of differences are revealed in the teaching-learning process by teachers who have significantly different levels of autonomy. Considering that autonomy is both a reason for and result of different teacher identity (Huang, 2011), this question becomes even more important.

The findings reveal that teachers' instructional autonomy positively contributes to the implementation process. A high level of autonomy is an important factor in teachers' ability to apply educational alternatives (Ullrich, 1992). Teachers with high perceptions of autonomy exhibited very successful practices for diversifying instruction. It was determined that these teachers were very successful in selecting activities based on student-centred methods and techniques suited to a constructivist approach and in putting these activities into practice effectively. This situation appears to conform with the related literature (Lamb, 2008; Lawson, 2004; Robertson & Jones, 2013; Trebbi, 2008). Teachers with high autonomy are successful in finding innovative solutions to problems that occur in the teaching process and in collaborating with other teachers when required. This situation is supported by the literature (Little, 1995; Mello et al., 2008; Ramos, 2006; Vangrieken et al., 2017).

Teacher autonomy expresses a person's ability and willingness to create areas for professional freedom in his/her own work environment (Benson & Huang, 2008). The findings reveal that teachers with low autonomy were not willing or competent with regard to varying instruction. These teachers, who depended mostly on traditional methods, conducted their classes with the same teaching method throughout almost the whole process. One of the reasons for this situation is that teachers found the time period allotted for the topics inadequate. This case shows parallelism with similar studies (Özcan & Düzgünoğlu, 2017; Ural-Keleş, 2017). It is true that lack of time is a serious problem that makes the implementation process difficult (Philips, 1991). However, an important reason why the teachers could not behave autonomously in varying their teaching is the fact that they focused only on achieving high test results. Another reason is that the teachers' ways of organising content affected the methods/techniques that they would use. While teachers' focus on description and examples when organising content directed them towards a limited number of traditional

methods, focus on daily life situations, multifaceted development and establishing relationships between subjects directed them to use different and contemporary methods.

One of the areas where teachers behaved autonomously was evaluation of students (Eurydice, 2008). The fact that teachers' levels of autonomy were different affected the evaluation process. Especially, the existence of centralised exams was a significant variable affecting the evaluation process. Teachers with low autonomy showed centralised exams as the main reason for including traditional components in the evaluation process. There is an extensive literature finding that central exams restrict autonomy (Benson, 2010; Crookes, 1997; Dymoke & Harrison, 2006, Hong, 2016; Lawson, 2004; Öksüz-Gül, 2015). Teachers with high autonomy were very successful in diversifying the evaluation process and making it student-centred. These teachers frequently included contemporary assessment approaches (self-peer- performance evaluation, etc.). Although these teachers felt as responsible as teachers with low autonomy with regard to preparing students for central exams, they also insisted on holistic assessment of students and making evaluation a part of learning. In evaluating students' participation in lessons, however, the teachers displayed a similar approach. This situation may be a reflection of a common culture formed by the understanding of evaluation of participation in lessons.

It is seen that whether or not teachers included higher-level cognitive skills in the process depended on their autonomy levels. While teachers with low autonomy hardly ever focused on higher-level thinking skills, teachers with high autonomy spent a great deal of effort on developing these skills. This situation is consistent with the literature that reveals that teacher autonomy encourages students' self-evaluation and critical thinking skills (Nguyen & Walkinshaw, 2018). In fact, both groups of teachers regarded themselves as incompetent during the first years of their careers as to how to instil these higher-level cognitive skills in students. However, teachers with high autonomy made a conscious effort to overcome their deficiencies in this area and made this process a part of their professional development. This situation supports the idea of the relationship between teachers' responsibility for their own development and their autonomy (Bustingorry, 2008; Lamb & Reinder, 2007; Smith, 2000; Usma & Frodden, 2003). However, although teachers with low autonomy accepted their weak points, they had no motivation to energise themselves. The fact that teachers with a low feeling of autonomy were less willing to change is compatible with the literature (Common, 1983; cited by Friedman, 1999).

Classroom management is one of teachers' fields of expertise (Boyer, 1984) and teachers' ability to make decisions regarding classroom management is in indicator of their autonomy (Cakir & Balcikanli, 2012). Establishing order in class, conducting activities successfully and creating an environment in which students can feel safe is generally under the control of the teacher. Establishing order in class and maintaining discipline was regarded as a common point of classroom management by all the teachers taking part in the research (Doyle, 1985). One of the differences created by teachers' autonomy in their approaches to classroom management was related to their setting of seating arrangements. Teachers with high autonomy made definite decisions and quickly put these decisions into practice when creating the most suitable seating arrangement for the method they were using. These teachers regarded not only the classroom but the whole school as an area where students could have experiences, and used various seating arrangements. Teachers with low autonomy, on the other hand, conducted all classes with a traditional arrangement of desks. The fact that they preferred teacher-centred standardised teaching methods can be given as a reason for this situation. The fact that these teachers frequently resorted to management by narration made it impossible for them to attempt different practices regarding seating arrangements. One difference in classroom management was determined to be the way teachers enabled students' participation in lessons. Teachers with high autonomy, who made a conscious effort to involve all students in lessons, made a reduction in problem behaviours and an increase in students' motivation possible. However, teachers with low autonomy were seen to be unsuccessful in activating all students. This situation emerged as a natural result of teachers' dependence on a single method. Moreover, although these teachers did not have any intention to discriminate between students, they conducted their classes through a specific group of students. For this process, which develops spontaneously, to be rectified, teachers with low autonomy need to make a conscious effort just as teachers with high autonomy do.

Conclusion

In this study, it has been determined that teachers' levels of autonomy create a significant effect on their use of modern and student-centred approaches, their classroom management, the ways in which they organise content, their inclusion of higher-order thinking skills and enabling their professional development. Teachers with high curriculum autonomy are more successful in enriching the implementation process and creating an effective learning environment. However, low autonomy levels direct teachers towards traditional approaches and impoverish the teaching process.

Teachers' instructional autonomy is correlated with their preference for contemporary approaches. The knowledge and skills related to contemporary approaches in teachers with low autonomy are regarded as insufficient. The fact that these teachers very rarely include modern approaches reveals that they are deprived of reflection skills, which are an important component of autonomy (Cakir & Balcikanli 2012). Teachers should be aware of these limitations, but instead of feeling weak, they need to strengthen themselves by finding opportunities and room for manoeuvre (Lamb, 2000). Therefore, providing teachers with practical knowledge and skills related to different educational practices via

in-service training is considered important. Initiatives in this area are reported to enable a change in teachers' traditional educational approaches in favour of a more student-centred pedagogy (Manzano-Vazquez, 2018).

Considering that teaching is not a technical task but a professional career area, teachers having autonomy over the curriculum that they implement will enable them to organise instructional goals, content, the teaching-learning process and the evaluation process according to students' needs and individual learning differences.

Suggestions

Considering the findings obtained in this study, there are inferences for policy makers, researcher and practitioners. Since the power to enrich the instruction process is revealed by autonomy, teachers primarily need to be given training related to the nature of autonomy and the positive effects it creates on implementation. With this aim, it is important for teacher training programmes at universities to be organised in such a way as to develop teachers' autonomy competencies (Benson & Huang, 2008, Little, 1995). Moreover, good quality inservice training organised by the Ministry of National Education can assist teachers in this area. Based on the fact that the content of a lot of inservice training is prepared under the effect of national initiatives rather than individual needs (Draper, 2000; Dymoke & Harrison, 2006), it is important that the recommended training is focused directly on autonomy. This training will increase awareness, which is an important component of autonomy, thereby increasing the possibility that teachers will display more autonomous behaviour. A point that must not be forgotten is that teachers should not regard autonomy as a competence to be given to them, but that they should regard it as a part of their professional development.

Limitations

Findings obtained from the research are limited as data obtained the in-class observation process and data obtained from teacher interviews. This research was done in a few public school in Izmir. Also, a similar study of this research can be done for different teachers.

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