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From the Editor

Gifted youth education and learning from social media, a new concept proposal in education literature: garbage learning

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Abstract

Many technology-based learning tools such as post-pandemic social media, virtual learning and now metaverse learning have positive aspects. However, social media has started to take its place in learning practices as a tool that provides verbal cultural transfer in the medieval period and underdeveloped societies. This situation of social media, which does not have much control, supervision and questioning, has led to the emergence of a new concept of learning. I present this new concept as "garbage learning" to the educational research literature. Does garbage learning affect the education of young scientists with a milky mind? I make suggestions for JEGYS to be a platform that creates academic discussions around this subject.

Keywords:
social media, new concept for education literature, garbage learning, gifted youth

For ten years, many articles have been published in JEGYS in the field of advanced science education, gifted education, talent education, new models in education, advanced and good practices, and sustainability of education. We are very happy and honored to be members of such an academic platform. We've also published eight great articles in this issue. Special thanks to the authors and referees.

As an editor and member of JEGYS, it has always been my goal to open up new avenues and areas in educational research. It wasn't easy for JEGYS to publish quality articles in a niche area for ten years. However, we see that the popularity and impact factor of JEGYS is quite high and this aspect keeps it quite dynamic.

While creating the preface to this issue, I realized that both our author base and readership have expanded due to the interdisciplinary aspects and broad scope of the articles in this issue. That's why I wanted to explain some issues that can guide our academic research.

The nature of the learning of normals and the nature of genius are not of the same nature. Time and space prevent us from reaching the power of genius. To understand Darwin's theory of what the world was like millions of years ago, we only need to build a time machine. We will. We have developed devices that now show invisible lines in Faraday's electromagnetic theory. Now even the normal person can understand. However, the brain of that genius was more powerful than the tools that could be made 200-300 years later. Now, we carry out social learning beyond socialization with social media tools that provide all kinds of information to people easily. This type of learning has been at the center of our lives, even more intensely after the pandemic, without filter, without argument, without criticism and effectively. It also affected our learning in many areas, and even introduced a new type of learning. I would like to propose "garbage learning" to the educational literature. Why is this term, because garbage does not always contain bad, used things that have no essence and good side, sometimes good things can happen. But garbage learning should never replace good learning practices in our pedagogies.

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Gifted youth, their desire to be a leader, and sometimes socialization problems can expose them to garbage learning. That's why I think it's important to research all aspects of "garbage learning" and its effect on gifted youth. Research and discussions on this subject are not enough (Freeman, 2016; Davidson Institute, 2021). I recommend increasing it.

Index applications of JEGYS will continue in the new year. We especially care about our application to the Web of Science index. That's why we want our members on the editorial board to update their profiles. You can also contribute to the visibility of JEGYS by using the publon platform. I would like to hand over the editorship of JEGYS in 2022, so I invite the editors and editorial board members to email editorjegys@gmail.com with their CVs..

Best regards

Dr. Hasan Said Tortop
Editor-in-Chief of the JEGYS

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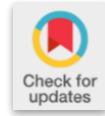
Research Article

Pastoral care for children in conflict with the law at correctional facilities

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Article Info	Abstract
	The purpose of this paper is to examine pastoral care standards afforded to children in conflict with the law (CCL) at correctional facilities. Pastoral care is the response by caregivers to the needs of young offenders such as emotional suffering and moral injury. Pastoral care plays an essential role in the lives of the CCL. The need for pastoral care and assistance for CCL with several personal problems is growing. This study employs interpretive qualitative paradigm to investigate the experiences of the young offenders and the role played by pastoral care in correctional facilities, the content of pastoral care and the degree to which pastoral care is beneficial to rehabilitation. The study, which took place in 2020, included eighteen participants. The findings reveal that pastoral care utilise a combination of religious and lay methods of counselling and is highly favourable to rehabilitation. Further, it was found that the people offering pastoral care view rehabilitation of CCL as fundamental to correctional treatment and has been linked to the decline in reoffending. The article concludes that the serious shortage of trained individuals to offer beneficial pastoral care and counselling for (CCL).

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Introduction

The purpose of this research study was to examine pastoral care counselling afforded to (CCL) in prisons. An investigation of the religious lives of CCL requires, amongst others, a consideration of the religious practices in which they engage, the regularity with which they do so and the ways in which such practices are related to spiritual well-being of CCL (Doehring, 2018; Waters, 2018; Graham, 2017). Spiritual services and counselling in prison, however, is not without controversy. Some religious practices are unlawful and inspires CCL to participate in religious endeavours to gain access to enticements not offered to non-spiritual CCL (Nieuwenhuis, 2012).

All religions are connected with a host of practices such as meditation, abstaining, the attending of religious gatherings, reading or studying religious doctrines (Bidwell, 2018; Helsel, 2015; Wilber 2007). An essential aspect of pastoral care by the religious counsellors is spiritual counselling (McClure, 2013; Werdel, Dy-Liacco, Ciarrocchi, Wicks, & Breslford, 2014; Moyo 2014; LaMothe, 2018). Pastoral care is the agency of the spiritual counselling in a context which intends to guide and empower CCL and the community in general. The aim of pastoral care is to allow development and safety of CCL and society at large (LaMothe, 2018; Moyo 2014).

This study discusses literature review, pastoral care of CCL, describes the methodology that this study has assumed in this study. The research paradigm, the data collection strategies as well as the ethical

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considerations are discussed. The findings and the discussions are analysed and interpreted. In the last analysis, the recommendations and conclusion are then drawn.

Literature Review - Pastoral Care Counselling

Todd (2011) identifies the primary role of pastoral caregivers for CCL as guidance and healing. Believing in God is a propensity to ease pains of incarceration. Dedicated CCL find pastoral care services that assist for prison life. Unfortunately, not all CCL opt for pastoral care programmes (McClure, 2013).

Pastoral care acts of anxiety, compassion, kindness, sympathy and affection, in most cases are being presented by pastoral care counsellors, to CCL who are in unlucky circumstances such as being affected by the moral injury and loss of freedom (Graham, 2017). Individuals with stressful uninhibited spiritual, spiritual and moral damage, resulting from need for pastoral care for therapy and nourishment (Helsel, 2015:7; Graham, 2017: 26). Doehring (2018:41), asserts that 'spiritual care and counselling are traditionally concerned with curing, achieving, nurturing, reconciliation and freedom.'

Frequently when we hear of the use of pastoral care to rehabilitate CCL many people get uneasy. Nevertheless, scholars on CCL see the necessity of not disregarding the spiritual aspect when rehabilitating CCL (Ramsay, 2017). It is believed that God's grace is at work through the developing personalities of CCL. It is not the intention of this article is to convey a one-dimensional approach to the needs of CCL, or to contemplate that the only concern in the troubled CCL should be pastoral care (Waters, 2018). Instead, it must be acknowledged that their needs are essential and complicated. The main object is to motivate CCL and give them purpose as well as a reason to live. When CCL start to understand God's intention with them, this can turn their lives around (Pargament, Wong & Exline, 2016).

Pastoral care is a God's directive to be involved in all His children's lives. The demand for pastoral care and support for CCL cannot be undermined (Helsel, 2015). CCL are greatly in need of pastoral care and often do not know whom to turn to despite the fact that pastoral care is the function and responsibility of everyone (Evans, Stanley, Barrera, Exline, Pargament & Teng, 2017). The all-embracing purpose of this article is to highlight the urgency of mounting concern for CCL. This is very critical in that it enables them to understand the effect of their actions and the damage that has been done (Louw, 2013).

Theoretical Framework

The theory that is underpinning this study is Bronfenbrenner's (1979) bio-ecological model. The theory focuses on a child's growth in the setting of interactions that make up his or her world. This theory describes complicated levels of settings that have an effect on a child's growth (Engler, 2007). The interaction amongst aspects in the child's developing ecology, his close family and neighbourhood atmosphere motivates and leads the child's growth. Variations or disagreements in one stage will swell all the way across other stages. To understand a child's developmental changes, we need not only look at the child and their current situation, but also at the dealings with the bigger ecosystem as well (Wilbur, 2008).

This bio-ecological theory recognises five environmental structures, and they are micro-, meso-, exo, macro- and chronosystem. A child, family, school and other influences, such as the educational and financial composition of surrounding community, including rules, laws and legal structures can lead to defiant CCL (Bronfenbrenner, 1979). It is not adequate to examine personal aspects, such as family, peers or school independently. The significance of this theory regarding the children's court system is the dealings between CCL and the ecosystem. The criminality, in this situation, committed arises as the workings of the relations between CCL and the ecosystem, which may consist of but is not restricted to family, friends, prison, and society.

The idea behind juvenile justice system is to modification of behavioural predispositions of CCL(Lightfoot, Cole & Cole, 2008). To "demonstrate that human development has occurred, it is necessary to establish that a change produced in the person's conceptions and activities holds over to other situations and other times" Bronfenbrenner (1979: 35). This transformation is important in the life of CCL when they make the choice not to commit a crime again for the reason of the influences of their environment.

Bronfenbrenner's bio-ecological theory specifies that as a child develops, the interaction with their situations becomes further complex. This complication develops as the child's bodily and mental structures grow and mature. Thus, given that nature continues on a specific progression, how does the realm that surrounds the CCL theorize and sustain their harsh growth? (Wilbur, 2008). In this theory, the schemes within the societal milieu and events in which CCL partake, for example, family, friends, education environment, and correctional facilities can be favourably used as learning setting that can offer a chance and support structures for development. To the degree that they furnish sufficient support, prospects, and positive assets for personal development, social situation can accomplish a significant part in enabling CCL's development in the optimistic path of restoration (Danziger & Ratner, 2010).

Problem of Study

The spiritual needs of CCL are not given the necessary attention within the prison system. The facilities, most of the time, have no qualified specialists to offer proper quality religious essential services. The rehabilitation services that are used in the system are not appropriately successful in solving the challenges of CCL. Rehabilitation practices should target the areas that are most problematic to CCL and attempt to address them. For instance, many CCL lack a decent education, and work-related skills including spiritual psychotherapy. If these types of rehabilitation methods become successful, this will not only boost the livelihood of CCL, but will also lessen reoffending rates (Bales & Mears, 2008).

When a child has committed a crime, the child's best interests are most significant, more considerable than any other matter. It is, therefore, evident that there is a necessity for socio-ecological consideration and support for CCL and use of appropriate approach that can be integrated into their rehabilitation practices.

Methodology

The qualitative research approach was used to answer research questions about the pastoral care for CCL and its benefits employing life histories (narratives) and focus group interviews to collect data. This article is positioned within the interpretive paradigm which allows for an in-depth study of the perspectives and experiences of CCL who benefitted from pastoral care and counselling.

Research Paradigm

This article sought to understand meaning from numerous viewpoints, challenges and the benefits of pastoral care for CCL at correctional facilities (Cohen, Manion, & Morrison, 2007). Thus, the research problem is most suitably placed within an interpretive paradigm for people develop constant individual meaning to their existence (Lincoln & Guba, 2005). Aligning the research within this philosophy allowed for the perceptions and experiences of those aiding from spiritual care to be studied in-depth. This paradigm approach was also applicable as it spawned some patterns of value on pastoral care for CCL (Creswell, 2002). Interpretive paradigm approach pursues to obtain entry to people's rational acumen and thus to explain activities and societal world from the participant's viewpoint (Denzin & Lincoln, 2005).

Understanding the multifaceted and evolving nature of the pastoral care for CCL through an interpretive approach was very significant. Denzin and Lincoln (2005: 3) explain that "qualitative researchers study

things in their natural setting, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them"..

Data Collection Strategies

This article is also the result of qualitative narrative research that utilised in-depth narrative (life histories). The research was directed as narrative research within an interpretive paradigm. According to interpretive paradigm, people live their lives by the narratives (stories) that they create in language and in relationships with others. In this study, the participants were requested to write as much as they can about their life histories. Since we create our own realities in stories, we are also able to re-create those stories (Morgan 2000). Focus groups were similarly used, where a group pastoral care was interviewed jointly in order to attain a correct interpretation of the views of the group (Lofland, Snow, Anderson & Lofland, 2006). Focus groups were chosen as the most proper procedure for this study for the subsequent purposes. Firstly, in a focus group interviews, participants have more control, and the structure is adaptable (Lofland, Snow, Anderson & Lofland (2006). Focus groups are normally designed out of pre-set questions over a set subject with certain answers. Embracing this approach granted for in-depth individual and group debate about direct encounters, experiences and particular perspectives regarding the pastoral care of CCL. Using focus group interviews also had the benefit of permitting participants additional time to contemplate and to remember their experiences, as suggested by Fontana and Frey (2005). Using this strategy for this research study allowed for the depth and tractability required to improve on understanding the participants and how they understand spirituality.

Pastoral care in this study was able to mainly manage the dialogue around the pre-set questions and the essential circumstantial features of the role from within each prison to occur. Placing the investigator in this study the perceptions and insights of those with experiences of pastoral care to be explored deeper. Secondly, in a focus group discussion, reactions can ignite more thoughts or associations for other participants permitting change or intensification of ideas (Lofland, Snow, Anderson & Lofland, 2006; Fontana & Frey, 2005). Focus group discussions created dialogue that was a more trustworthy explanation of what CCL experienced through pastoral care.

Table 1. Participants Structures

No	Gender	Age	Code
1	Male	14 years	P1-M-14
2	Male	16 years	P2-M-16
3	Female	14 years	P3-F-14
4	Male	15 years	P4-M-15
5	Male	13 years	P5-M-13
6	Male	17 years	P6-M-17
7	Female	16 years	P7-F-16
8	Male	15 years	P8-M-15
9	Male	17 years	P9-M-17
10	Male	15 years	P10-M-15
11	Male	13 years	P11-M-13
12	Male	17 years	P12-M-17
13	Female	16 years	P13-F-16
14	Female	14 years	P14-F-14
15	Male	15 years	P15-M-15
16	Male	16 years	P16-M-16
17	Female	15 years	P17-F-15
18	Male	17 years	P18-M-17

Ethical Considerations

The CCL may have withheld opinions that they did not want to share. However, it can be confirmed that the compassionate and comfortable atmosphere that was observed within each focus group enabled participants to speak freely, openly and disagree. The focus groups were restricted to about fifty-minutes. All participants had the right to withdraw their participation. Three focus group interviews were conducted, and eighteen participants (Participant 1-18) took part, all focus groups had six participants.

Results and Discussions

Eighteen CCL participated (Participant 1-18 [P1-M-14>P18-M-17]) in focus group interviews and narratives (life histories) to probe more deeply into the issues of CCL. The findings in focus group interviews and narratives (life histories) of CCL indicated that there is need for their moral restoration. The findings further showed that pastoral renewal can result in reduced criminal predispositions and the possibility of a meaningful life for the CCL.

The findings indicated that several factors directly or indirectly influenced participation in pastoral care activities. These included personal justification, dealing with the emotional anxieties, feelings of guilt, finding a new way of life, dealing with the loss of freedom, shortfall of safety, access to outsiders.

The responses in focus group interviews and narratives (life histories) of CCL show that there is need for their moral repair. Pastoral restoration can result in diminished illegal propensities and the possibility of a momentous existence for the CCL.

Personal Justification

Attributing an individual's spiritual change to personal reasons is a difficult task because the motivation to change becomes an intangible element that is derived from within. The best way to describe this type of change is that these individuals experience spiritual transformation for personal gain and satisfaction distinct to social benefit or obligation and the benefit is intrinsic. Personal reasons for change allow an individual to look deep within oneself and provide an opportunity to afford more meaning to one's life (Griffith 1995:137). For example, a person realises during imprisonment that he needs to change his past habits because he is unhappy.

Bosch (1991:412) signifies pastoral care as the total task God has set the religious for the redemption of the world, which always relates to a specific context of evil, despair and lostness. It embraces all activities that serve to liberate man from his bondage of sin. The pastoral care is sent into the world, to love, to serve, to preach, to teach, to heal, to liberate. The prison pastoral caregivers are dedicated to reach the lost and the prison need to provide the ideal setting to do their job (Hayes & Dowds, 2015).

> "*CCL are forgotten, abandoned or condemned by most, so we are particularly lost and needy. Those that come to our group, know that they need to change, to be different. Some are already believers, some have some religious background as children, and some are totally excommunicated from their churches. It is a pleasing honour to be among people who listen and want to know about God.*" – Pastoral caregiver

> "*Because prison can be such an inhuman experience the presence of pastoral care in prison is vital. No other group can provide the same sort of human contact. The majority of people in prison are facing personality issues and they have usually taken up some inappropriate way of being in the world. Pastoral care can give trust, happiness, a sense of a hope and stability. Even non-believers can find the life of pastoral care inspiring. Change cannot occur until there is some sense of individual inspiration and need. I believe that pastoral care can fulfil that need and give the chance to live life of purpose greater than the simple gratification of worldly desire.*" – (P8-M-15)

"*Undeniably, being in prison has had an overwhelming impact on me as a person. I dare to think what person I may have become. I certainly acknowledge the stance of the meaning of a man that is held by the many of the young offenders. Being in prison has been a blessing in disguise. It is incredible how little time you really set aside for pausing, reflecting and imagining while you are in the normal culture. The misfortune is that coming to prison, for my family and for me, may in the long run be worthy, because with pastoral care and a great deal of available time to reflect, I think I have discovered my true self.*" – (P13-F-16)

"*After attending the pastoral care services for the previous two years, I have converted into a person who receives himself and others unreservedly. I can now give and receive warmth without emotional barriers. I do not hide my emotional reaction and I am able to stand up, examine and evaluate feelings of shame, rage, jealousy and to surpass these emotions by using the teachings of forgiveness and acceptance.*" – (P6-M-17)

"*I have watched again and again as young offenders who have been given the space to think about themselves and their lives, young offenders who came into prison railing against the unfairness of the world and denying all responsibility for the crime for which they have been convicted, have now stood to own the chaos that was their life before prison. They have finally owned their crime and the hurt they have inflicted on others and expressed their determination to make their own future and the future of their children a more constructive experience. I have watched the light come on in the eyes of young offenders as they have realised that they do have a place in the world; they do have a contribution to make; they do have a right to be alive.*" – (P11-M-13)

Lashlie (2002:107) reflects that if CCL are given the personal space and time to reflect on their wrongdoing, they can change and accept the liability for their actions and start to believe that they can create a better future.

Dealing with the Emotional Anxieties

How does pastoral care help CCL adjust to prison? A series of individual and group interviews were conducted to address this question, and the responses of CCL indicate ways that pastoral care might help to improve adjustment to prison, such as dealing with the emotional stresses of imprisonment and dealing with the loss of freedom in the prison environment. One of the most common answers to questions about the enthusiasm for pastoral care in prison had to do with the emotional struggles the CCL feel about being in prison. Pastoral care holds possible routes out of imprisonment dilemma, for it not only clarifies faults and failures, but it also suggests the resolution.

"*Being incarcerated makes you bitter towards the world. They think it is going to make you better, but it does not.*" – (P5-M-13)

"*The truly religious become stronger. They can deal with the problems that affect them, and they can ease the troubles that affect you, and they can help you to be able to avoid more crimes.*" – (P12-M-17)

The right of religious freedom is a provision granted to all people including those in prisons. Still, observing religious activities can be withheld due to the maintenance of compliance, safety and regulation. While it is a right to practice one's religion, CCL, have in several cases needed to reassure and uphold their rights to freely practice their religion. The denial of access to pastoral care may possibly create a wasted chance for the time of imprisonment to be used in reconstructive way.

It is significant that the CCL who are in prison ought to have and need their residual rights recognised. In addition, the CCL are in need of pastoral care and psychological health, social, and reconstructive

services. That time spent imprisoned would be best spent in ensuring rehabilitation. There are many ways wherein CCL say pastoral care can alleviate the agony of imprisonment.

Feelings of Guilt

With the exception of loss of freedom, the most powerful message of imprisonment is guilt. CCL can tum to pastoral care for relief, as a kind of free from the work of evil in the world, as recompensation and reconciliation.

> *"Being a believer, I can go and ask chaplain pastor to help receive forgive me for my sins and to get the strength to deal with my problems."* – (P3-F-14)

> *"Beware of the tricks of the devil. He has a lot of tricks. He uses the things of the world. He will use people to get in your face. He uses different ways, but you have to be wise. You have to avoid it."* – (P6-M-17)

Many religious CCL do not excuse their guilt. Instead, they seem to accept a deep personal obligation for their offences and for the wrongdoing. As one young offender said that:

> *"If you talk to everyone here, they'll tell you that they in prison because of a blunder. Many say it was a bad attorney, or a stupid mistake in the way they did the crime. The spiritual young offender realises that the fault was doing the crime to start with."* – (P17-F-15)

Finding A New Way of Life

Among the main displays of pastoral care available within the inner experience there is growth, inner independence, integrity, spiritual mindset, moral principles and resistance in the direction of wickedness (Griffith 1995:137). One of the main aspects that CCL offered in talk about the significance of pastoral care is that it transformed them. One young offender put it articulately in this way:

> *"My faith has made me excited about when I go home."* – (P14-F-14)

> *"Religion is a guide how not to get out of hand; it gives you a straight path."* – (P1)

Inmates who embrace pastoral care tend to be profoundly dedicated to strict models of spiritual life. This enables a type of total substitute, wherein the habits of the past are secondary to a different, completely determined way of living, the one that can be thought of as established.

CCL also draw value from their spiritual preference as a way in which they feel an effective role of God in their lives. They see a change that enables them to cope with the difficulties of prison.

> *"Anything that's happened in our lives, God did it. Almighty wants you to be absolutely blank so He can complete you."* – (P15-M-15)

Pastoral care includes faith combined with teaching that motivates to seek holiness and promote virtue. The kind of spiritual life that distinguishes individuals in terms of quality of life. The CCL branded by an enthusiastic spiritual life focused on belief, exhibited a considerably greater level of hereafter quality of life than any other type of life.

Dealing with the Loss of Freedom

Undoubtedly freedom is an important principle of particular aspects of religions of the world, where a deafening difference is made between things of the world and that which belongs to God. In prison, where there is a reign of threat and deprivation, this is very prudent teaching, for the person who focuses on the costs sustained by being imprisoned are likely to become disturbed (Hayes & Dowds, 2015).

"It is not the prison that incarcerates us, it is a man's mind. I am able to live a normal life and uphold my character with dignity. The first objective of prisons is to strip you of your dignity. It takes your self-esteem, your dignity, and everything about you. Pastoral care has helped me to regain this." – (P16-M-16)

My faith was not as strong until after being imprisoned. Suddenly I found myself alone and with no one. That is when faith and belief in God became stronger. It kept me sensible.

"The only thing that is lacking in here is freedom of movement and women, but that is only a state of mind. I've seen some guys who don't really realize that they are in prison because it is not the prison that they see, it is the walk with God. Prison doesn't bother them anymore." – (P12-M-17)

One way to understand the deprivation of peace is to relate it to the primary loss of freedom. There is no loss more fundamental explained to prison than the loss of freedom. Whatever else the prison does, it makes the young offender stay in a place that he would not choose.

Shortfall of Safety

The combination of the deprivations imposed by prison life and the destructive culture imported into it, makes the prison environment a difficult setting in which to live. After all, prisons are filled with lawbreakers, and many of them are there because a court felt they represented a threat to the safety of the community (Hayes & Dowds, 2015). There are some CCL for whom safety fears may be intensified, especially the physically weak, homosexual or sex offenders.

"The sex offenders show up in the religious groups so that they will not be hurt. They need to be safe. A person with a nasty crime is accepted into the group. Whether you did the crime or not, they are going to protect you." – (P6-M-17)

"If the guy is weak, and we know that he is weak, we are compelled in our religious group to protect him and help him grow spiritually, because we do not know what is in his heart." – (P10-M-15)

Even for CCL who are not particularly weak, the chapel is a safe sanctuary, a place where a young offender can go, where the safety threats of prison life are reduced. Participation in any kind of pastoral care exposes a young offender less to the complications of prison life, merely by socialisation with other spiritual CCL.

Access to Outsiders

Participation in pastoral care programmes also provides access to outsiders, particularly women. When asked CCL about the deprivations in prison, their interaction with people who are outside prison were mentioned, and special emphasis was on how pastoral care offered them an opportunity to meet with women (Hayes & Dowds, 2015).

"Because of women who came from outside. We are in jail, so we want to see the women.

Sometimes there will be some good-looking volunteer ladies in the chapel on a Sunday. Then you're likely to see the place filled, with all the boys coming to stare and enjoy." – (P13-F-16)

The CCL who met outside visitors are thus able to defeat the walls of prison in some way. They are able to recover one of the comforts of life they lost when they entered the prison, although their achievement is only limited and vague. CCL often talked about pastoral care by recalling the change in their lives (Herholdt 1998).

"When faith arises in us, we find a transformation in our mindset. Some say spirituality keep us mentally normal. Many discover purpose and begin preparing for a new and distinct way of life when they leave prison. Some are very bold in taking others along." – (P12-M-17)

"I will never forget the experience. I could not hold back the tears that were streaming down my cheeks. I had this instant feeling of belonging, the emptiness was filled, hunger and thirst were appeased." – (P14-F-14)

"The initial real human contact with anyone in prison was with prison pastor who was the only person who seemed concerned and my meeting with prison pastor has continued outside." – (P5-M-13)

"You are my friend and a reward from the heavens. I have a greater strength than ever before and a deeper commitment. The scriptures meant a lot to me, it was a response to my condition in a very practical way. The scripture spoke for itself in incarceration. I had never had so much time for the scripture." – (P8-M-15)

It is clear from this account that the strength of pastoral care that allow CCL to survive and even to grow spiritually. It would be ideal if this form of spiritual experience could be demonstrated in correctional facilities as a basis of encouragement to assist CCL in enduring the aches of confinement (Sykes 2007).

Conclusion and Recommendations

The spiritual component of rehabilitation is necessary for the needs of CCL needs to be taken seriously. As pastoral caregivers of CCL acknowledge the legitimacy of spiritual development, they can provide opportunities for the outside involvement of individuals from the religious community as the effort to offer more complete rehabilitation.

The findings in this study could be of practical use to those concerned with the wellbeing of CCL in general and, specifically, to those working with CCL in religious contexts. Several strategies can be construed from the findings, such as the fact that not all CCL are religious and that all religious practices were found to be positively correlated with their spiritual well-being, suggests that efforts aimed at supporting and enhancing the spiritual lives of CCL are warranted and highly relevant. Pastoral care constitutes an important avenue through which the spiritual and general psychological well-being of CCL can be enhanced (Burnell *et al*. 2019; Patel *et al*. 2009).

Encouraging CCL to engage in religious practices more frequently and actively is likely to further enhance spiritual well-being, especially concerning practices such as performing acts of compassion to others and working to align personal behaviour with spiritual values and beliefs. Finally, although the high level of extremists attitudes that characterised the CCL were found to be positively associated with pastoral care of CCL (Van Breda 2012).

This article showed that pastoral care and counselling of CCL are mutually dependent and appropriate for the rehabilitation of the CCL. In addition, the CCL need to be assisted by transformative features of the rehabilitation programmes (Waters, 2018). The article established how conditions can be for or in contradiction of the processes of divine change and show the way as to facilitate the factors that are conducive to pastoral care and spiritual conversion can be intertwined into an active, holistic programme of rehabilitation for CCL (Pargament, Wong & Exline, 2016). Duplications on the theoretical framework showed how prior research related to pastoral care, spiritual change, faith development has been improved and expanded by the findings of this kind of research (Paquette & Ryan, 2001).

Pastoral care and spiritual development are affected by environmental factors, such as dysfunctional family, drugs and alcohol, which surpass the control of CCL (LaMothe, 2018). Added features must be there for CCL to encounter realisation leading to change, but regression following a phase of pastoral care and spiritual understanding may be brought about by other adverse aspects mentioned above.

The final implication of this article for future research and for related policy and practice is that there is a dire need for qualified pastoral caregivers.

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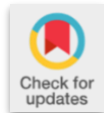
Research Article

A look at intercultural sensitivity from the perspective of mindfulness and acceptance of diversity[1]

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Article Info	Abstract
            	Although the concept of mindfulness is gradually increasing its use in the intercultural literature, it is seen that there has not been enough empirical research on the role of mindfulness in intercultural relations and the variables related to intercultural relations. One of the intercultural variables is intercultural sensitivity. In today's world, which is getting richer with increasing diversity, it can be said that approaching intercultural sensitivity from the framework of mindfulness will provide a more comprehensive understanding. Acceptance of diversity is one of the variables that are emphasized in the culturally sensitive approach processes. Therefore, it is thought that mindfulness and acceptance-based approaches will positively affect intercultural sensitivity. In this study, it was aimed to reveal the roles of mindfulness and acceptance of diversity variables in predicting the intercultural sensitivity levels of university students. The study is a descriptive research in which the correlational survey model was used and the data were collected with the convenience sampling method. 336 university students participated voluntarily in the study. Acceptance of Diversity Scale (ADS), Adolescent and Adult Mindfulness Scale (AAMS), Intercultural Sensitivity Scale (ISS), participant information form were used as data collection tools. Multiple Linear Regression Analysis and Pearson Product Moment Correlation techniques were used in the analyses. The findings revealed that the sub-dimensions of Adolescent and Adult Mindfulness Scale -focus on the present moment, being non-reactive, non-judgmental, self-accepting- and acceptance of diversity explained 33% of intercultural sensitivity level. As a result, it is a necessity to provide an inclusive and supportive environment free from discrimination for every individual of society and to protect their well-being. In order to foster intercultural sensitivity; it is of great importance to promote mindfulness and acceptance of diversity.

Introduction

In the early years, multiculturalism was defined as understanding the cultural diversity in the areas such as nationality, ethnicity, and language as a concept that emphasizes diversity in societies (Kymlicka, 1995). In subsequent years, the content of concept was expanded to include orientations such as different sexual orientations, weight, and disability, and it began to be viewed as a very broad structure that touches everyone's life (Glazer, 1997). According to Sue and Sue (2012), any form of interpersonal communication is considered an intercultural interaction. Multiculturalism opposes the idea of melting in the same pot, which expresses the understanding of assimilating smaller groups under

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the dominant culture and refers to adding each individual's identity and characteristics to the pot as color and richness (Song, 2010). However, it is seen that non-dominant groups face many obstacles in societies where strict, judgmental, and harsh rules and views prevail (Irvine, 2003). One of these obstacles is microaggressions, defined as harmful, humiliating behaviors, verbal injustices, thoughts and attitudes that are automatically directed against a particular person or group without their awareness (Pierce et al., 1977). It is observed that individuals who are exposed to microaggressions have psychological problems such as low self-esteem, depression, suicide attempts, anxiety (Kaufman et al., 2017; Nadal et al., 2014), intense negative emotions such as anger, hopelessness, disappointment, stress (Stewart et al., 2006), and harmful consequences such as academic failure, job burnout, and poor social relationships (Ong et al., 2013). Therefore, in today's world, where the world is becoming more global, and especially in societies that receive many immigrants, multiculturalism becomes an issue that needs to be emphasized and a phenomenon that aims to provide equal rights to each individual.

The 21st century is an era in which international cooperation has increased; travel, transportation, and communication are widespread; technology has developed, and globalization has come to the fore; people with different cultural characteristics and orientations live together, collaborate, and interact more than ever (Davis et al., Cho, 2005; Scheuerman, 2010). Along with globalization, migratory movements are among the most important factors in societies with a multicultural structure (Deardorff, 2006). It is stated that migration movements in the recent years have transformed Turkey (Ulukaya Öteleş, 2021), which already includes various ethnic groups and has a multicultural structure, into one of the migration countries with the status of a safe country (Ünal & Gedik, 2022). Therefore, in today's Turkey, the concept of intercultural sensitivity, which expresses the effective approach to differences and the development of flexible perspectives in environments such as work environments, family circles, schools, and universities, where cultural diversity is increasing, plays an important role (Marx & Moss, 2011).

Intercultural sensitivity was developed based on intercultural communication studies (Bennett, 1986) and sought to explain individuals' responses to cultural differences and similarities (Altan, 2018). Furthermore, intercultural sensitivity appears as the ability to understand and value cultural similarities and differences (Hammer et al., 2003) and to distinguish culturally diverse individuals' perceptions, emotions, and behaviors (Altan, 2018). In this regard, the intercultural sensitivity is one of the most effective skills to bend false assumptions and stereotypes about individuals belonging to different ethnic groups/cultures (Rodríguez-Izquierdo, 2022).

According to Bennett and Bennett (2004), intercultural sensitivity is addressed within the developmental model of intercultural sensitivity. Individuals undergo several stages depending on how they perceive and respond to cultural diversity. Each of the six identified developmental stages focuses on how individuals experience differences. The denial, defensiveness, and minimization stages are referred to as ethnocentrism and include recognizing cultural differences, reducing polarized views and judgments, and understanding the importance of differences within the similarities. The next three stages are referred to as ethnorelativism and include acceptance, adaptation, and integration processes. It is seen that individuals who have passed to the ethnorelativism stage can recognize differences, accept them with respect, adapt their own values and ways of interaction to other cultures, and feel they belong to more than one cultural group.

Intercultural sensitivity is considered a prerequisite for intercultural communication (Aksoy, 2016) and one of the most important means of avoiding or resolving communication problems and misunderstandings that may occur between individuals (Straub et al., 2007). Also the intercultural sensitivity enables individuals to think in different ways, view situations and phenomena from different perspectives, and facilitate interactions between culturally diverse individuals (Liu & Zhang, 2022). Additionally individuals with high levels of intercultural sensitivity respect the differences between individuals, accept differences, approach cultural differences and others' perspectives more sensitively and empathetically (Cheung et al., 2022) and their social intelligence (Yenphech & Intanoo, 2022), and happiness levels are higher. (Öğüt, 2017). Therefore, considering the changing structure of society, it is essential to develop intercultural sensitivity in individuals and to teach these skills and attitudes to the next generations in a globalized world (Struppert et al., 2010).

Universities are one of the environments where students of many different genders, religions, languages, and ethnic backgrounds come together, and therefore, multiculturalism is experienced most intensely (Rodríguez-Izquierdo, 2022). University exchange programs such as Erasmus, Farabi, and Mevlana (Kartarı, 2014) and international student quotas initiated by the Council of Higher Education in Turkey (2019) as part of internationalization policy also enrich diversity in the universities and open a window into new perspectives for the students. In the universities where cultures come together, students learn new things from each other, become aware of many things, and get to know themselves and others. From time to time, they may argue because of their different views and characteristics. Thus, the university environment helps each individual understand that they are unique and special. In addition, university students with high levels of intercultural sensitivity are more open to intercultural knowledge, interaction, and teamwork (Bennett, 2017). At this point, it is of great importance to develop intercultural sensitivity for university students who share the same desks, residence hall, homework, and memory with the individuals from other cultures and to examine the variables that play a key role in the development of intercultural sensitivity. Bennett (1993) argues that the development of intercultural sensitivity occurs through increased awareness of cultural differences, structures, experiences and acceptance of cultural diversity. Therefore, the present study assumed that awareness and acceptance of other university students' beliefs and styles would facilitate sensitive interactions and the variables of mindfulness and acceptance of diversity were examined as predictors of university students' levels of intercultural sensitivity.

The Relationship Between Mindful Awareness, Acceptance of Differences, and Intercultural Sensitivity

The concept of mindfulness, which underlies third-wave cognitive behavioral therapy systems (Kahl et al., 2012), is defined as the ability of individuals to direct their attention to the moment they are in, to their behaviors, emotions, thoughts and sensations that occur at the moment (Kabat-Zinn, 2005), a metacognitive state of awareness (Brown et al., 2007), a non-judgmental attitude mixed with curiosity and compassion, and an understanding that is open to newness accompanied by sincerity and acceptance (Teper et al., 2013). According to Kabat Zinn (2005), the mind tends to form judgments in terms of black and white by categorizing the facts and situations to reduce cognitive load. However, it has been shown that people with high levels of mindfulness can easily recognize the judgments they make automatically, make more objective assessments, see reality as it is, and use compassionate language in place of their inner critics (Brown & Ryan, 2003). Mindfulness studies with different variables in different domains such as social life, business, professional life, and academic life has been shown to improve social skills (Manusov et al., 2020), facilitate adaptation and coping (Ghahremanlou et al., 2021), protect psychological satisfaction and physiological health (Hero, 2020), bring success in business and school life (Lampe & Müller-Hilke, 2021; Li, 2022), and increase life satisfaction (Dirzyte et al., 2022). Despite the increasing number of studies addressing the concept of mindfulness within intercultural literature (Zegarac et al., 2014), it should be noted that very few studies have been conducted on this topic. Therefore, uncovering the potential role of mindfulness in developing intercultural sensitivity is expected to be an important contribution to the field.

It is of great importance for individuals to be aware of cultural background of others, to maintain an acceptance and compassion-oriented approach by reducing situations and emotions such as insecurity and helplessness experienced during the interaction process, and to adapt to cultural diversity for effective communication (Moosmüller & Schönhut, 2009). It can be said that mindfulness plays a role in developing and increasing intercultural sensitivity (Menardo, 2017). First of all, it can be said that avoiding and resolving communication problems will facilitate interactions between culturally diverse individuals thanks to the increased level of metacognitive awareness (Straub et al., 2007), the sense of curiosity will allow a better understanding of cultures by promoting a deeper knowledge of different cultures (Thomas, 2006), and the non-judgmental attitude will reduce prejudice towards different cultures (Djikic et al., 2008). In addition, mindfulness can contribute to intercultural sensitivity through its attitudes that emphasize flexibility, adaptability, and openness to new experiences (Davis & Cho, 2005).

A high level of mindfulness means that the individuals are aware of different cultures and their values, beliefs, and norms in the interaction process and are open to acknowledging and understanding these cultures and approaches (Chen & Starosta, 2000). Furthermore, mindfulness involves the individual's ability to see his or her own culture in

relations with other cultures (Fantini, 2000). Therefore, it can be said that mindfulness acts as a bridge for individuals to achieve the equipment they need to have intercultural sensitivity.

Acceptance means maintaining an understanding of equality among differences, accepting and respecting differences and similarities. Acceptance does not mean loving and agreeing with the perspectives or values of others (Bennett & Bennett, 2004). Acceptance represents that individuals clarify their perspectives on different cultures and values, can accept the cultural explanations of others, and are willing and interested in explaining their own culture and values (Bennett, 2001). Acceptance of diversity stands for respecting the differences between culture, behavior, and values (Medina et al., 2004). The differences mentioned encompasses all aspects of diversity, including language, age, gender, race, ethnicity/culture, ability, and socioeconomic status (Sanders & Downer, 2012).

It is important to understand and accept individuals within the frame of their own cultural context (Doğan, 2005). In this context, accepting diversity is considered as a goal to be achieved in multicultural structures and approaching ideas and practices without prejudice (Banks and Banks, 2001). In that case promoting acceptance reduces discriminatory, racist behaviors and prejudice (Bernstein et al., 2000). In addition, it is emphasized that accepting diversity without judgment (Gervais & Hoffman, 2013) allows individuals to develop positive relationships with individuals from other cultures (Simmons et al., 2010) and increases empathy skills (Napoli & Bonifas, 2011). According to Fritz et al. (2001), individuals with high intercultural sensitivity are aware of and accept cultural similarities and differences. Therefore, accepting self and others as they are is another factor that should be considered in intercultural sensitivity (Bakioğlu, 2017).

It is noted that mindfulness and acceptance-based approaches are culturally sensitive therapies and these approaches show promise for individuals from marginalized and non-dominant cultures (Fuchs et al., 2013). For example, acceptance and commitment therapy, which is within the spectrum of mindfulness, has decreased people's judgment (Lillis & Hayes, 2007). As a result, intercultural sensitivity (Rathje, 2007), which is recognized as an important tool for reducing misunderstandings that may occur between people from different cultures and creates opportunities for people to collaborate productively, solve problems effectively, and live together, should be considered within the framework of mindfulness and acceptance of diversity. It is expected that this will greatly benefit to the research and the field of application.

Problem of Research

Problem statements of the study:

- Is there a significant relationship between the level of mindfulness, acceptance of diversity, and intercultural sensitivity of university students?
- Do the level of mindfulness and acceptance of diversity significantly predict the level of intercultural sensitivity of university students?

Method

Research Design

This study is a descriptive research in which the correlational survey model, one of the quantitative research types. Survey models describe situations that existed or still exist in the past, while correlational survey models attempt to uncover the relationships between variables and the degree of those relationships (Crano et al., 2014; Karasar, 2009). In this study, intercultural sensitivity constituted the dependent variable, while mindfulness and acceptance of diversity were taken as the independent variables.

Participants

The study group consisted of 336 university students studying in different departments of four different state universities in Turkiye. In the studies that use regression analysis, when determining the sample size, it is stated that 40 participants should be included for each number of predictor variables (Pallant, 2015). From this point of view, it can be said that the number of participants of 336 individuals is appropriate for this study.

In the study that used the convenience sampling method, the data were collected through online platforms from the students who voluntarily participated in the autumn term of 2022-2023 academic year. 58.03% (195 students) of study group were female, and 41.97% (141 students) were male. The average age of students was 20.42 years. Demographic variables such as gender, class, department, number of siblings, mother's education level, father's education level, mother's employment status, father's employment status, /family financial situation, the place where most of life was spent, and immigration status are included in Table 1 is shown below:

Table 1. Demographic Information of Study Group

Variables		N	%
Gender	*Female*	195	58.03
	Male	141	41.97
Grade	*1ˢᵗ Grade*	101	30.06
	2ⁿᵈ Grade	88	26.19
	3ʳᵈ Grade	81	24.11
	4ᵗʰ Grade	66	19.64
Department	*Child Development*	107	31.84
	Sociology	67	19.94
	Theology	19	5.65
	Psychological Counseling and Guidance	61	18.15
	Social Sciences Teaching	35	10.42
	School Teaching	47	13.98
Number of Siblings	*Only Child*	20	6
	Two siblings	124	36.9
	Three Siblings	85	25,3
	Four and Above Siblings	107	31.9
Mother's Education Level	*Is illiterate*	30	8.9
	Can only read and write.	13	3,9
	Elementary School Graduate	158	47,0
	Secondary School Graduate	79	23,5
	High School Graduate	49	14,6
	University Graduate	6	1,8
	Postgraduate Education	0	0
	Death	1	0,3
Father's Education Level	*Is illiterate*	1	0,3
	Can only read and write.	8	2,4
	Elementary School Graduate	156	46,4
	Secondary School Graduate	66	19,6
	High School Graduate	65	19,3
	University Graduate	26	7,7
	Postgraduate Education	2	0,6
	Death	12	3,6
Mother's Employment status	*Housewife*	266	79,2
	Self-Employment	25	7,4
	Private Sector	27	8
	Retired	8	2,4
	Officer	3	0,9
	Other	7	2,1

Father's Employment Status			
	Unemployed	20	6,0
	Self-Employment	89	26,5
	Private Sector	55	16,4
	Retired	76	22,6
	Officer	24	7,1
	Other	72	21,5
Financial Status of Family	*Very Low*	13	3,9
	Low	72	21,4
	Moderate	239	71,1
	High	11	3,3
	Very high	1	0,3
Where Majority of Life was Spent	*Village-Town*	87	25,9
	City	249	74,2
Migration Status	*Yes*	103	30,7
	No	233	69,3
Total		336	100

Examination of Table 1 shows that the majority of study group consists of first-year students (30.06%), they have two siblings (36.9%), and their parents have a primary school degree (47-46.4%). In addition, if we look at the occupational distribution, we notice that mothers are mostly housewives (79.2%), and fathers are self-employed (26.5%). They consider their financial situation as moderate (71.1%), and they spent most of their life in the city (n=179; 46.9%). When asked if they had a migration experience in their life (urban/rural), 30.7% of respondents indicated that they had migrated, while 69.3% indicated that they had no migration experience. When the 103 participants who reported being migrated were asked to rate their happiness level on a scale of 10, it was found that their happiness level was slightly above average (see Table 2).

Table 2. Happiness Levels of Students in the Place of Migration

	$\bar{X}$	**SS**	**Min-Max**
Level of Happiness in the Immigrated Place	5.8	2.74	1-10

Data Collection

Intercultural Sensitivity Scale (ISS)

ISS was first developed by Chen and Starosta in 2000 to measure the intercultural sensitivity level of 414 university students. The scale consists of 24 items, is a 5-point Likert-type scale that can yield a total score, and has five dimensions. The Cronbach's alpha coefficient for the scale's total score was calculated to be .86. The scale was adapted into Turkish by Üstün (2011) as a part of dissertation study on university students. After adaptation, it was found that the scale consisted of 23 items and had a unidimensional structure. The Cronbach's alpha coefficient of scale was .90. In this study, Cronbach's alpha coefficient was calculated to be .87.

Adolescent and Adult Mindfulness Scale (AAMS)

AAMS was developed in 2018 by Droutmana et al. It is a 19-item, 5-point Likert-type scale. The scale underwent five stages in its development, which was applied to different sample groups in each stage. The first stage of study was conducted on 589 university students, and it was found that the scale can give a total score and has four sub-dimensions. These dimensions are focused on the present moment, being non-reactive, non-judgmental, self-accepting. While Cronbach's alpha coefficients of sub-dimensions were .54, .77, .68, .74. The Cronbach's alpha coefficient of scale was .81 for total score. The scale was adapted into Turkish by Sarıçam and Çelik in 2018. In the adaptation study with 317 university students and 200 high school students, the 19-item and four-dimensional structure of scale was confirmed. The Cronbach's alpha coefficient for the total score was calculated as .84. The Cronbach's alpha coefficients of subdimensions were .79, .93, .67, and .70. In this study, Cronbach's alpha coefficient of .87 was obtained for the total score and .86, .76, .88, .75 for the sub-dimensions.

Acceptance of Diversity Scale (ADS)

ADS was developed by Deniz and Tutgun-Ünal (2019) and aims to assess the level of acceptance of individuals with different religion, ethnic origin, appearance, thought and life values in environments such as family and work life. The scale, developed on 516 participants, is a three-dimensional, 9-item, 5-point Likert-type scale that can yield a total score. These sub-dimensions are labelled as *acceptance of diverse ethnicit/religions, appearances and values/ideas*. The Cronbach's alpha coefficient for the total score was .77. The Cronbach's alpha coefficients for the sub-dimensions were calculated to be .67, .63, and .56. In this study, Cronbach's alpha coefficient of .83 was obtained for the total score and .56, .76, .79 for the sub-dimensions. According to some researchers, the reliability coefficient of scale of .60 and above means that the scale is acceptable (Baştürk, 2014; Clark & Watson, 1995; Sipahi et al., 2008). However, because of the reliability coefficient of scale's acceptance of diverse ethnicit/religions sub-dimension was less than .60, only the total score of scale was used in this study.

Participant Information Form (PIF)

PIF was created by the researcher and contains demographic information about the school, department, gender, age, grade level, number of siblings, parent's education level, parent's employment status, perceived family financial situation, and participants' migration experiences.

Data Analysis

The analyses of study were performed with SPSS 24.00. Before starting the analysis, the data set was examined in terms of outliers, and the data of six participants were excluded from the data set. It was found that the skewness and kurtosis values of dataset were between -1.5-+1.5, meaning that the dataset follows normal distribution (Tabachnick & Fidell, 2013). Correlation levels and VIF values between variables were assessed for the multicollinearity. The correlation between independent variables was found not to exceed .90, and VIF values were less than 2.5 (Allison, 1999; Çokluk et al., 2012). From this point of view, it can be said that there is no multicollinearity problem in the data set. As a result, it was determined that the data set met the necessary conditions for analysis, and Pearson product-moment correlation and multiple linear regression analysis were applied.

Procedure

After obtaining the necessary approvals from the Ethics Committee for the research through an application to the Ethics Committee of Dokuz Eylül University (document dated 6.08.2022 with the number E-87347630-659-327151), the data were collected online with the participation of university students voluntarily. The descriptive statistics of students' scores in ISS, AAMS, and ADS are shown in Table 3.

Table 3. Descriptive Statistics Regarding the Scores Obtained from ISS, AAMS, and ADS

	N	x̄	SS	Min.	Max.
Intercultural Sensitivity	336	91.06	0.63	63	114
Mindfulness	336	76.71	0.57	50	95
- Focus on the Present Moment	336	38.33	0.31	24	45
- Being Non-Reactive	336	11.20	0.14	5	15
- Being Non-Judgmental	336	16.6	0.18	6	20
- Being Self-Accepting	336	10.5	0.16	3	15
Acknowledge the Diversity	336	35.61	0.40	13	45

Examining Table 3, it can be seen that the students participating in the study scored above average in all the scales and sub-dimensions. The results of Pearson product-moment correlation analysis, which includes the relationships among the variables in the study, are shown in Table 4.

Table 4. Pearson Product-Moment Correlation Analysis Results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intercultural Sensitivity	1	.42**	.39**	.30**	.40**	.06*	.40**
Mindfulness		1	.87**	.62**	.74**	.52**	.20**
- Focus on the Present Moment			1	.35**	.55**	.24**	.13**
- Being Non-Reactive				1	.36**	.28**	.11**
- Being Non-Judgmental					1	.12*	.17**

- Being Self-Accepting	1	.09*
Acknowledge the Diversity		1

**<.001; *<.05

As can be seen in Table 4, there were positive and significant relationships between intercultural sensitivity and acceptance of diversity (r=.40; p < 0.01), total mindfulness score (r=.42; p < 0.01) and the sub-dimensions of mindfulness, focus on the present moment (r=.39; p < 0.01), being non-reactive (r=.30; p < 0.01), being non-judgmental (r=.40; p < 0.01), and being self-accepting (r=.06; p < 0.05). It was found that there were positive and significant relationships between acceptance of diversity (r=.20; p < 0.01) and total mindfulness score and the sub-dimensions of mindfulness, focus on the present moment (r=.13; p < 0.01), being non-reactive (r=.11; p < 0.01), being non-judgmental (r=.17; p < 0.01), being self-accepting (r=.09; p < 0.05).

The results of multiple linear regression analysis conducted to examine the predictive role of mindfulness and acceptance of diversity in intercultural sensitivity are shown in Table 5.

Table 5. Multiple Linear Regression Analysis Results Regarding the Predictive Role of Mindfulness and Acceptance of Diversity

	B	S.E.	β	t	p
Constant	39.17	4.41		8.86	.000**
Mindfulness					
- Focus on the Present Moment	.38	.11	.19	3.42	.001*
- Being Non-Reactive	.79	.23	.17	3.43	.001*
- Being Non-Judgmental	.62	.19	.18	3.13	.002*
- Being Self-Accepting	.15	.18	.04	.79	.428
Acknowledge the Diversity	.55	.07	.35	7.56	.000**
R= .58; R^2 = .33	Adjusted R^2 = .33				
$F_{(5-330)}$ = 32.81	p= .000				

**p<.001; *p<.05

As seen in Table 5, the results of multiple linear regression analysis, mindfulness, and acceptance of diversity statistically significantly predicted the level of intercultural sensitivity of university students (R=.58, R^2=.33, adjusted R^2=.33, p<.001). The sub-dimensions of mindfulness, focus on the present moment, being non-reactive, being non-judgmental, being self-accepting and acceptance of diversity together explained 33% of change in the level of intercultural sensitivity. The results of t-test showed that the sub-dimensions of mindfulness, such as focus on the present moment (t=3.42, p<.05), being non-reactive (t=3.43, p<.05), being non-judgmental (t=3.13, p<.05), and acceptance of diversity (t=7.56, p<.001) contributed statistically, significantly to predicting the level of intercultural sensitivity. In contrast, the contribution of being self-accepting (t=.79, p>.05), one of the sub-dimensions of mindfulness, to the model was not statistically significant. A one unit increase in the focus on the present moment sub-dimension led to an increase of 0.38 unit in the intercultural sensitivity. A one unit increase in the being non-reactive sub-dimension led to an increase of 0.79 unit in the level of intercultural sensitivity. In addition, a one unit increase in the being non-judgmental and the acceptance of diversity led to an increase of 0 .62 and 0.55 unit in the intercultural sensitivity.

Discussion and Conclusion

Due to the reasons such as war, migration, globalization, and economic conditions, it can be observed that cultures are converging, and the societies are rapidly adopting a multicultural structure (Yılmaz et al., 2019). Turkish culture already has a very rich cultural diversity (Bektaş, 2006). For individuals living in such a rich cultural structure, it is of great importance that they are interested in communicating with individuals from other cultural groups and are sensitive to differences in their own culture and other cultures (Chrobot-Mason et al., 2013; Fowers & Davidov, 2006; Hammer et al., 2003). However, it is not possible to maintain healthy intercultural interaction in an environment where prejudice and discriminatory attitudes are prevalent (Lupano Perugini & Castro Solano, 2011). For a successful and peaceful social life, interacting with different cultures, living together with individuals with cultural differences,

working, and being open to different cultures seem to be one of the competencies that the individuals need to have in the 21st century (Eğinli & Yalçın, 2016; Renk & Polat, 2014).

Universities are among the environments where intercultural sensitivity is gaining the most importance (Menardo, 2017). It is noted that the international students mobility programs increase cultural diversity in the universities (Abaslı & Polat, 2018). In such an environment, due to the low level of intercultural sensitivity of students, contact between different groups is insufficient or can sometimes reach dangerous levels (Menardo, 2017). Therefore, it is of great importance to emphasize cultural and ethnic diversity in the higher education, promote multicultural interaction and understanding between the students and the faculty members, and help the students understand the experiences of individuals of different ethnicities and cultures in the academic environment (Enyeart Smith et al., 2017). From this perspective, the intercultural sensitivity levels of university students were examined in the context of mindfulness and acceptance of diversity. Results of study showed that 30.7% of students had a migration experience in their life and their happiness level in the migration place was slightly higher than the average level. It was found that there were positive and significant relationships between intercultural sensitivity and acceptance of diversity, the total mindfulness score, and the sub-dimensions of mindfulness, focus on the present moment, being non-reactive, being non-judgmental, being self-accepting. In addition, it was found that the mindfulness and acceptance of diversity were statistically significant predictors of university students' level of intercultural sensitivity. The sub-dimensions of mindfulness, focus on the present moment, being non-reactive, being non-judgmental, being self-accepting, and acceptance of diversity explained 33% of change in the level of intercultural sensitivity (R=.58, R^2=.33, adjusted R^2=.33, p<.001). Considering the results, it can be said, as Bennett (1993) suggested, that the key role of mindfulness and acceptance of diversity in developing the intercultural sensitivity has been confirmed.

According to Chen and Starosta (2000), the individuals in the intercultural interaction should be aware of similarities and differences between cultures. It is stated that the individuals with a high level of intercultural sensitivity should have some certain characteristics, and these characteristics include attitudes related to the mindfulness such as being empathetic, not judgmental, and being open-minded. (Chen, 1997). In Deardorff's model of intercultural competence, mindfulness-based constructs such as curiosity/exploration, empathy, respect and openness have an important place (Deardorff, 2006). In addition, the literature defines the intercultural sensitivity as an increase in the individual's awareness of other cultures, a decrease in their prejudices (Trang et al., 2003), and approaching situations from different perspectives (Hammer et al., 2003). Based on the relevant explanations and definitions, it can be said that mindfulness and intercultural sensitivity are interrelated and that the skills in relation to the mindfulness can be used to develop intercultural sensitivity levels.

It is importantis for the individuals to be aware of their biases and values, to understand people from other cultures, and to respect their values (Sue et al., 1992). Recognizing that one is a product of cultural experiences and appreciating differences also promotes cultural growth and development for the individual. Mindfulness helps individuals communicate better and feel more genuine and comfortable in their interactions (Haas & Langer, 2014). In addition, mindfulness has been shown to have positive and significant relationships with variables such as intercultural sensitivity (Menardo, 2017), culturally sensitive counseling competencies (Bakioğlu, 2017; Ivers et al., 2016; Tourek, 2014), cultural intelligence (Thomas, 2006), and intercultural communication effectiveness (Khukhlaev et al., 2022).

Tadlock-Marlo (2011) states that mindfulness plays a key role in acquiring values related to the intercultural sensitivity and transmitting those values to the future generations. Similarly, according to Gay (2000), being aware of cultural differences and how differences affect our culture forms the basis of ethno-relative phase of Bennett (1993)'s intercultural sensitivity model. This is supported by the fact that the individuals with high levels of mindfulness can view the situations and the events from different perspectives with an open mind (Zakaria, 2000) and tend to have curiosity and interest in other people's experiences and cultures (Fritz et al., 2001), and can see the situations and the events in their context. It is shown that they can see how they are, and they can create new mental maps of individuals' cultural backgrounds (Gardner, 1995; Menardo, 2017). It can be said that mindfulness has an important place in the intercultural literature with its features.

It is stated that the individuals with high levels of intercultural sensitivity exhibit high levels of empathy (Fujimura, 2022). Empathy is considered a concept related to mindfulness, and it is found that the empathy can be developed through mindfulness practices (Goenka, 1993). Studies have also shown that the mindfulness-based training improves empathy skills (Bohecker & Doughty Horn, 2016; Davis & Hayes, 2011; Rybak, 2013; Shapiro et al., 2011). In addition, a study with psychological counselors showed positive and significant relationships between mindfulness and empathy (Greason & Cashwell, 2009).

By monitoring mental processes, mindfulness reduces prejudice (Djikic et al., 2008) and racial dilemmas (Kucsera, 2009), reduces and controls stereotypical thoughts and automatic behaviors (e.g., microaggression responses given automatically without being aware of it because they are adopted over time) through metacognition (Bird & Osland, 2006), thus it is stated that it develops sensitivity towards different cultures (Ivers et al., 2016). This is because when individuals begin to become aware of evaluation and judgment processes, they understand their conflicting emotions and where these emotions come from, and they exhibit more open and flexible behavior toward others (Brown et al., 2007; Thomas, 2006). On the other hand, Niemiec et al. (2010) found that university students with low levels of mindfulness were more likely to be defensive and judgmental of other cultural perspectives. A prejudice that is not true and leads to individuals being excluded and humiliated is one factor that prevents intercultural interaction (Ügeöz, 2003). Therefore, it is of great importance for the individuals to move from the ethnocentric stage, where they judge others, to the ethnic relativistic stage, where they are open to experiencing other cultures and cultural contexts (Üstün, 2011). It can be stated that mindfulness plays an important role in this process.

Mindfulness acts as a bridge between the knowledge and the attitudes that affect the cultural intelligence. For the sensitive intercultural interaction, individuals should know different cultures, values, and perspectives (Sue et al., 1992). Mindfulness arouses an individual's curiosity and desire to learn and drives him or her to acquire knowledge. In addition, mindfulness processes direct attention to the most accurate and appropriate information and ensure that information is consciously transmitted (as opposed to autopilot mode) (Baer et al., 2006; Thomas, 2006).

According to Bennett and Benett (2004), one of the most important indicators of high levels of intercultural sensitivity is the degree of acceptance and tolerance of diversity. The individuals with the low levels of intercultural sensitivity are more prone to not accepting intercultural differences and refusing to interact with the individuals from other cultures (Zhu, 2011). In Bennett's (2001) Intercultural Sensitivity Model, it can be seen that ethnocentrism stages focus on avoiding cultural differences. In these stages, the existence of differences is denied, defense mechanisms against differences are developed, or differences are trivialized. On the other hand, in the stages based on ethnorelativism, it is stated that the differences are accepted, those different perspectives are accommodated, or the individual accepts that differences as part of his or her identity, and the integration occurs. In particular, it can be said that *the acceptance step* is closely related to the acceptance of diversity.

The development of intercultural sensitivity begins with the development of one's inner processes, and characteristics such as accepting, respecting, and appreciation of differences are considered indicators of intercultural sensitivity (Matveev & Yamazaki Merz, 2014). According to Bulduk et al. (2011), the intercultural sensitivity is the understanding and acceptance of cultural differences. Based on this definition, it can be said that the variable of acceptance of diversity is one of the most important building blocks to ensure the intercultural sensitivity. Similarly, Chen and Starosta (2000) state that one of the characteristics of individuals with a high level of intercultural sensitivity is the tendency and desire to accept differences.

Individuals with a high level of acceptance of diversity view the differences and values of other cultures as equivalent to their own culture and can accept them as *different structures representing reality* rather than *insignificant illusions* (Hammer et al., 2003). Acceptance increases understanding and tolerance for the experiences that cause distress or discomfort to the individuals (Brown et al., 2007). Studies show that the acceptance is positively and significantly associated with the intercultural sensitivity (Menardo, 2017; Ryu, 2022) and negatively, significantly associated with the avoidant coping strategies (Öksüz & Öztürk, 2016). In addition, the results of a study conducted in

Argentina, which aimed to determine the acceptance level of students, revealed that the students with a high acceptance level tend to give positive attributes to the students of other nationalities (Castro Solano, 2013).

As a result, it is necessary to create an inclusive and supportive environment without discrimination for every member of society and to protect the health and well-being of individuals (Emami & Safipour, 2013). It is very important to develop the necessary skills for effective interpersonal, interethnic, and intercultural group interactions among university students and to promote values, attitudes, and behaviors that support cultural diversity to ensure the intercultural sensitivity (Bonder et al., 2004). In this context, in order to foster intercultural sensitivity; it can be said that mindfulness and acceptance of diversity will play important roles.

Recommendations

Some suggestions for researchers and practitioners are listed below;

- Kneller (1965) states that the content of all education programs should be culturally sensitive to solve the problems that may arise concerning cultural differences and avoid misunderstandings. Therefore, it can be said that the inclusion of courses and/or units on cultural sensitivity in the education programs and the discussion of contents related to cultural sensitivity with the university students in the classes will have an important place in developing cultural sensitivity.

- It can be stated that the mental health professionals working in the universities can conduct psycho-educational programs to improve the intercultural sensitivity in the university students through the seminars, the group work, or the individual studies.

- In the process of developing intercultural sensitivity skills, it can be aimed to increase the level of students' mindfulness, acceptance of diversity, and informative activities can be conducted. Mindfulness and acceptance-based techniques and approaches can be used in this context.

- It can be said that the intervention programs based on mindfulness, acceptance, and sensitivity to the differences also positively impact students' professional lives (Chiner et al., 2015).

- Faubl et al. (2021) have shown in their studies with the university students that as the period of education progresses, the difficulties arising from the differences decrease, students gradually move to the ethnorelativism based stages and begin to focus on the positive aspects of multicultural environment in which they live. From this point of view, it can be said that the orientation studies should be given more emphasis so that the students can easily and quickly adapt to the university life, and topics such as mindfulness, acceptance of diversity, and intercultural sensitivity can be included in orientation studies.

- The research can be conducted with larger sample groups to cover the universities in all geographic regions of Turkiye, or it can be conducted with the students in different age groups, such as elementary and secondary schools.

- In future studies, the variables such as self-compassion, psychological flexibility, and cognitive flexibility can be included in the examination of intercultural sensitivity.

Limitations of Study

The results of this study are limited to the data obtained from 336 university students studying at four different state universities in Turkiye in September 2022. In addition, the results obtained are limited to the data collected from the Acceptance of Diversity Scale (ADS), Adolescent and Adult Mindfulness Scale (AAMS), Intercultural Sensitivity Scale (ISS), and the findings produced by the SPSS 24 statistical program.

Acknowledgements

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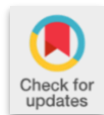
Research Article

The relationship between multiple representations and thinking structures: example of the integral concept

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Article Info	Abstract
  	This study, it was aimed to examine the effect of teaching the concept of integral with multiple representations on the concept definitions of teacher candidates. And also, the effect of teacher candidates' thinking structures on their use of multiple representations was investigated. In the experimental study process algebraic, graphical and numerical representations were used together in teaching the concept of integral at university level. Since the course content was designed by supporting multiple representations, a quasi - experimental research design was used in the research. The research was carried out in the 2021 - 2022 academic year with pre-service teachers studying in the primary school mathematics teaching department of a state university. Within the scope of the research, Mathematical Process and Integral Concept Test were used. The data obtained from these scales were analyzed quantitatively and qualitatively. Regardless of the thinking structures of the pre-service teachers, it has been determined that concept definitions include different representations depending on the teaching style supported by multiple representations in the course. It has been observed that the thinking structures of the pre-service teachers affect their representation preferences slightly, if not too much, while defining the concept. However, it has been determined that there are no sharp boundaries in the types of representation used by participants with different thinking structures. Even though the pre-service teachers had different thinking structures, they used multiple representations in their concept recognition. It can be concluded that this situation has a connection with the use of multiple representations in the lesson in addition to the thinking structures of the participants. It can be concluded that this situation has a connection with the use of multiple representations in the lesson in addition to the thinking structures of the participants. According to this result, the use of more than one representation in teaching a concept enables students to learn the concept in a versatile way. For this reason, it can be said that the use of multiple representations in teaching the concept of integral provides a higher level and deeper learning. This situation can be generalized to other mathematical concepts as well.

To cite this article:

Introduction

Mathematics is a course with different contents at different teaching levels and can be compared to a large building with many floors. Each floor of this building represents different levels of mathematical science, and rooms on these floors can also represent different mathematical concepts. One of these concepts is the concept of integral. The concept of integral is used for various calculations in many branches of mathematics, especially in the analysis course.

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The definite integral includes the calculation of area and volume and various geometric operations. In the numerical representation of the definite integral, Riemann sums are used. In this notation, cumulative sums, namely Riemann sums, are used to present the definite integral. In the graphical representation of the definite integral, the region bounded by the curves is calculated. In the algebraic representation of the definite integral, there is the Fundamental Theorem of Analysis and various algorithms (Thompson and Silverman, 2008). So, in general, the expression $\int f(x)dx$ is expressed with different meanings as cumulative sum, area, calculation, total change between two points on the graph. While the indefinite integral is expressed only with numerical calculations, the definite integral is expressed with geometric and applied solutions such as area and volume calculations (Edwards & Penney, 1994).

In general, according to the definitions used by students, it can be said that they generally define the integral as the inverse of the derivative or the area of a region. It is an understatement to say only "the inverse of the derivative" or just "the area of the region" for the integral. For this reason, the use of multiple representations is important in the teaching of the analysis course. Especially in teacher training faculties, the use of multiple representations becomes more important. Because mathematics teachers need to be trained in this subject in order to use multiple representations. As a general case, it is a common educational problem that students are unable to grasp mathematical thinking and relate multiple representations. For this reason, many studies in the literature suggest to deepen the meaning of the concept of integral by using multiple representations and presenting different contents (Rasslan & Tall, 2002).

In the studies carried out, the use of different representations in the teaching of the integral subject, as in other subjects of mathematics, is supported by many educators (Girard, 2002; Goldin, 2004). In a different study in the literature, it was seen that the majority of the answers of the students were wrong due to the difficulty of the integral subject and the fact that it was taught with single representations (Rasslan & Tall, 2002). Researchers who criticize that the definite integral is taught only at the operational level, stated that the use of various numerical and geometric-graphic approaches in problem solving would improve students' conceptual knowledge (Ostebee & Zorn, 1997). Studies in the literature draw attention to the fact that multi-representation-centered learning approaches can improve relational understanding by expressing the relevant conceptual structure in different ways (Keller & Hirsch, 1998; Kendal & Stacey, 2003). There are some studies showing that students who use only one type of representation or cannot convert between representations have insufficient conceptual understanding. And these studies argue that the level of conceptual understanding will only increase with the use of multiple representations and associative learning (Aspinwall & Shaw, 2002; Hallett, 1991). According to all these, the use of multiple representations makes a great contribution to meaningful and deep learning.

Another structure related to different representation approaches in the learning process is students' thinking structures. Mathematical thinking profiles are divided into three groups (Krutetskii, 1976): Analytic, geometric and harmonic thinking (mixed - combination of visual and analytical thinking). Analytical thinkers tend to use symbolic representations in the problem-solving process. Those who are in the geometric thinking structure make use of visual representations rather than symbolic representations. Harmonic thinkers can use visual and symbolic elements together in cognitive processes. In other studies that group mathematical thinking profiles, it is stated that there are visual, non-visual (analytical) and mixed profiles (Clements, 1982). Although thinking structures are divided into groups according to different names, as a result, we can say that learners have different mental structures.

In researches on mathematics education, it is suggested that teaching processes should not be designed only for a single thinking structure, but should be designed in a holistic structure that includes multiple representations (Budak & Roy, 2013; Presmeg, 1986). Then, when different thinking structures are in question, we can talk about different leanning processes and different course presentations. One of the tools that enables the same subject to be told in different ways is the use of multiple representations. Representation is the expression of a concept or situation in different and various ways. Mathematical representation is the verbal, numerical, visual or algebraic expression of mathematical concepts. Representations are generally divided into two categories as internal and external representations. External representations are in the student's responses, and internal representations are in the student's mind (Cobb, Yackel, & Wood, 1992).

In this study, student responses to the concept of integral, namely external representations, were examined. Although there are different representation models in the literature, representation classifications developed by Lesh, Behr and Post (1987) are based on this study, because these representations include all sub-definitions of the concept of integral. These representations used in the research are grouped into four groups as numerical, graphical, algebraic and spoken language. The multiple representations used in this study are divided into four groups. Verbal, algebraic, graphical and numerical representation. Spoken language (verbal) representation; Expressing the solution in words in the process of problem solving or thinking. Algebraic representation ; using mathematical symbols in problem solving or thinking process. Graphical representation; using picture number lines, diagrams or diagrams in problem solving and thinking processes. Numeric representation ; using tables or matrices in problem solving and thinking processes.

The use of a single type of representation can result in an incomplete teaching process because in such a case only one aspect of the concept is emphasized. It is stated that the use of multiple representations is more effective in conveying the various meanings of mathematical concepts. Based on these statements, it can be said that explaining the concept of integral with algebra, graphic and numerical representations will provide academic success to the students in the analysis course (Cuoco & Curcio, 2001). Considering previous research, in this study, the concept of integral is not defined incompletely as only the inverse of the derivative or only the area of a region. Instead, the concepts of definite integral and indefinite integral are defined using flexible, holistic and various representations. In this study, it was investigated how the simultaneous presentation of numerical, graphical and algebraic representations of the concept of integral affected students' definitions of the concept of integral. In addition, the differentiation of students' definitions of the concept of integral according to their thinking structures was examined. In general, in this study, it is aimed to investigate the effect of teaching the concept of integral with numerical, graphical and algebraic representations on the concept definitions of pre-service teachers and the effect of their thinking structures on the definitions of the integral concept.

Numerical, algebraic and graphical representations, which are multiple representation types for the concept of integral, were used in this study. This section is organized to show the expression of the integral concept in different types of representation. In this research, these three representation types of the integral were included in the teaching process of the integral. Detailed information on the experimental study is given in the method section.

Graphical Representation

The concept of integral can most simply be expressed as the area under the curve on a function graph.

Let the function f be defined and continuous in the closed interval [a, b]. Also suppose that f (x) ≥0. The area bounded by the lines x = a, x = b, the y = f (x) and x-axis curve can be expressed as "the area under the curve f (x) from a to b" (Edwards & Penney, 1994)

Figure 1. Limited Area

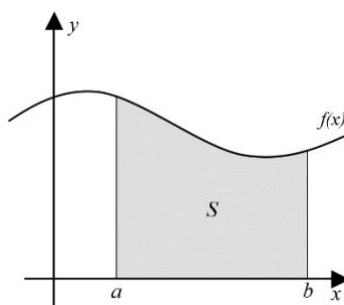**Algebraic Representation**

A function F is an antiderivative of a function f if F'(x) = f(x).

We use the symbol $\int f(x)dx$ called the indefinite integral, to represent the family of all antiderivatives of f(x), and we write $\int f(x)dx = F(x) + C$ if F'(x) = f(x).

The representation of $\int_a^b f(x)dx$ is is called the definite integral of f from a to b. (Barnett, Ziegler & Byleen, 2005)

The situations in which algebraic representations are frequently used in the concept of integral are expressions such as "calculate the integral". The algebraic representation of the integral involves using the Fundamental Theorem of Analysis.

Numerical Representation

This method deals with Riemann sums. In this representation, the concept of integral is represented by the total amount of change in a given interval. This interval is divided into infinite parts and the limit calculation can be found (Thompson & Silverman, 2008).

By definition, the definite integral is the limit of the Riemann sum.

$$\int_a^b f(x)dx = \lim_{n\to\infty} \sum_{i=1}^n \left[f(x_{i^*}) \Delta x_i \right]$$

$$\Delta x = \frac{b-a}{n} \text{ and } x_{i=} a + \Delta x.i$$

Formula 1. Numerical formula of the integral

These three different representations of the concept of integra are related to each other. With the numerical representation of the integral concept, the total amount of change is expressed. In the graphical representation of the integral concept, area calculation is made. In the algebraic representation of the integral concept, there are algorithmic operations. As stated above, numerical, algebraic and graphical representations were used together in the teaching process of the concept of integral within the scope of the present study.

Problem of Study

Teaching the concept of integral only as the inverse of the derivative or just the area of a region is considered insufficient. For this reason, it is considered important to teach the concept of integral with holistic and multiple representations. In this study, the effect of simultaneous expression of the algebraic, graphical and numerical representations of the concept of integral on the integral definitions of pre-service teachers was examined and in addition, it was investigated whether these definitions differ according to their thinking structures. The sub-problems of this research are as follows:

➢ Which is the preferred form of representation for the definition of integral by the teacher candidates?
➢ Does the thinking structure of the teacher candidates have an effect on the representation they prefer for the definition of integral?

Method

Research Design

In this study, the effect of teaching the concept of integral with multiple representations on the concept definitions of mathematics teacher candidates was examined, and in addition, the effect of their thinking structures (geometric, analytical and harmonic thinking) on the concept definitions was investigated.

In this study, descriptive method was used. The aim of the research is to examine the effect of teaching the subject of integral with multiple representations on the definition of integral concept of teacher candidates, so a quasi-experimental research design was used. Within the scope of the quasi-experimental research, in the first lesson, in which the mathematics teacher candidates will be introduced to the concept of integral, the concept of integral is not presented with a single representation, but by supporting it with multiple representations.

Participants

In this research, a non-random, convenient sampling method was chosen to determine the study group. Within the scope of the research, first-year pre-service teachers who encountered the concept of integral for the first time at the university level were preferred. Because, first-year pre-service teachers were preferred in the study so that the cognitive skills they acquired at different grade levels do not affect the research results. The study group consisted of 37 pre-service mathematics teachers. The research was carried out in the 2021-2022 academic year in the primary school mathematics teaching department of a state university.

Data Collection Tools

Two different measurement tools were used in this study. Firstly, the Mathematical Process Scale was used to determine the thinking structures of participants, and secondly, the Integral Concept Test was used to determine their integral concept definitions. Within the scope of the quasi-experimental study in the research, the concept of integral is presented by supporting it with multiple representations. After teaching the teacher candidates with multiple representations, the scales used in the research were applied sequentially. Detailed information about the two scales can be found in the section below.

Integral Concept Test

The concept definitions of the participants were evaluated with the test developed by Rasslan and Tall (2002). The Integral Concept Test is a test applied to determine the cognitive diagrams for the students' integral concept. In this test, there are two different questions. First, there is the statement "please define the concept of ....." to determine the formal definition of the concept, and then the question "What does the concept of ... mean to you" is included to determine the informal definition of the concept. The other questions in the Integral Concept Test were prepared to examine the solution processes of the students' problems related to the integral subject, but the problem solving processes were not included in this research because the concept definitions of the integral were emphasized in this research. This test is a test adapted to Turkish and expert opinion was sought for the linguistic equivalence of the test.

The Mathematical Process Scale

The Mathematical Process Scale is a measurement tool consisting of three parts. This scale was prepared by Krutetskii (1976) in order to measure the individual's thinking structures. It serves to determine the preferences of both teachers and students towards visual and non-visual methods in the solution processes of non-routine problems. The Mathematical Process Scale consists of three parts and these parts are named as A, B and C. The target audience of these three sections differs. Parts A and B are for students, parts B and C are for teachers. That is, the part that is common to both teachers and students is part B. Within the scope of this study, only certain parts of the scale were used, because the study was carried out with pre-service teachers, that is, students. There are 12 problems in section B, and 6 problems in sections A and C. Since parts B and C were used in this study, a scale with 18 questions in total was applied to the participants.

After the scale questions were applied to the students, a list of possible solutions was given to these questions. And students were asked to mark solutions similar to their own. In cases where the student could not find a solution close to his own solution, they were told to mark the "other" option.

Data Analysis

In the Integral Concept Test, participant responses were analyzed according to various categories using a descriptive method. In the process of determining the categories, the common themes in the answers of the pre-service teachers were determined and these common themes were expressed as frequency and percentage. For the analysis of this test, the evaluation instruction prepared by Rasslan and Tall (2002) was used. Here, the answers given by the pre-service teachers about the concept of integral were evaluated in three categories: Area, inverse of the derivative, and formula-specific answers. These response categories are also associated with graphical, numerical and algebraic representations. The expression of the concept of integral as the opposite of the concept of derivative has been evaluated in relation to algebraic notation. Expressing the integral as area calculation is under the theme of graphical representation. The numerical representation is represented as the calculation of the change between two points. The expressions in Table 1 below were used for all these categorical classifications. The answers given by the pre-service teachers were evaluated according to these categories and the frequency and percentage values were calculated. In addition, the answers of the participants were divided into categories as completely correct answers, partially correct answers, incorrect answers and blank answers.

Table 1. Response Categories According to Multiple Representation Types of Integral Concept Definition

Concept	Response Categories	Assessment Criteria	Multiple Representation Types
Integral	Completely Correct Answers	Exactly correct answers to the concept of integral	Graphical Representation
			Algebraic Representation
			Numerical Representation
	Partially Correct Answers	Partially correct or incomplete answers to the concept of integral	Graphical Representation
			Algebraic Representation
			Numerical Representation
	Incorrect Answers	Incorrect answers to the concept of integral	Graphical Representation
			Algebraic Representation
			Numerical Representation
	Blank Answers	No answer to the question	Graphical Representation
			Algebraic Representation
			Numerical Representation

The Mathematical Process Tool consists of two parts and there are eighteen questions in total. In the Mathematical Process Tool, there is a scale with students' own solutions and a list of different solutions for each problem. Participants are asked to mark one or more solutions that are similar to their own solution from this list of problem solutions. All questions in this scale can be solved by visual or non-visual methods. In the scoring stage of the scale, 2 points are given to visual solutions and 0 points to non-visual solutions. Solutions whose type is not specific are given 1 point. While scoring, it is not taken into account whether the answer is correct or incorrect, and points are given only according to whether it is visual or not. According to this scoring, the maximum score a participant can get from this test is 36 and the minimum score is 0.

According to any test result, it is not possible to distinguish individuals with sharp boundaries according to analytical, harmonic and geometric thinking structures. However, in this test, the thinking structures of teacher candidates are determined according to the lower and upper score limits of each thinking type. In the evaluation of this test, it is accepted that the group with the highest score has the geometric thinking structure, and the group with the lowest score has the analytical thinking structure. Participants with medium scores are evaluated in the harmonic thinking structure (Presmeg, 1986).

To determine the upper and lower limits of test scores, the difference between the highest score and the lowest score is calculated. Thus, the dispersion range is obtained. To obtain the class range, the distribution range is divided by the number of groups. Since there were three groups in total in this study as harmonic thinking structure, geometric thinking structure and analytical thinking structure, the distribution range was divided into three in this study. Thus, the minimum and maximum scores of the thinking structures, namely the boundaries, are determined. Within the scope of the current research, the lowest score that the pre-service teachers got from this test was 5 and the highest score was 29. Accordingly, the distribution range was calculated as 24. When this value is divided by 3, which is the number of groups, 8 is obtained. The class interval in this study was calculated as 8. According to this class range, it was accepted within the scope of this study that the participants who scored between 4-12 had an analytical thinking structure, those who scored between 13-21 had a harmonic thinking structure, and those who scored between 22-28 had a geometrical thinking structure. In this study, a dynamic structure was preferred in terms of scoring. Because this is a quasi-experimental study, only the participants in this study were considered.

Results

In this section, the findings obtained from the research are given. The basic statistical data regarding the scores of the participants from the Mathematical Process Scale are given below.
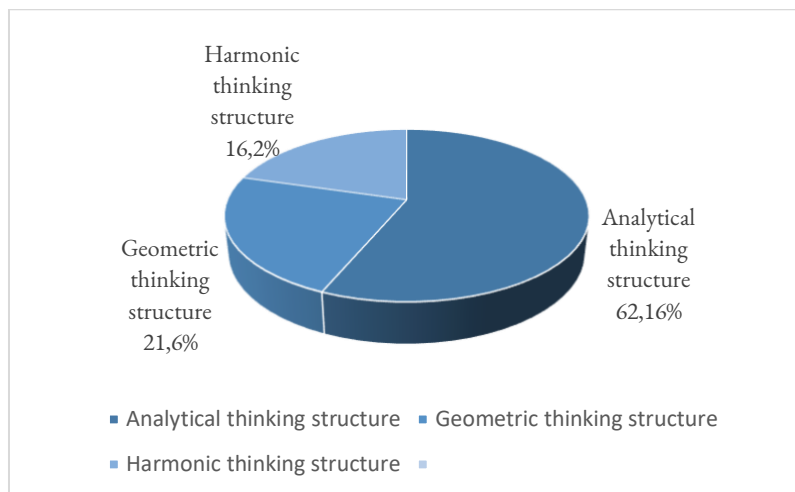
Figure 1. Pre-service Teachers' Thinking Structures Data

In this study, the lowest score that pre-service teachers got from the Mathematical Process Scale was 5 and the highest score was 29. While the maximum score that can be obtained from this test is 36, the average score of the participants in this study was calculated as 17,96. According to this average score, it can be said that the participants in this study preferred analytical processes instead of visual processes in mathematical problems.

In this study, which examined the types of concept definition responses according to the thinking structures of the participants. It was determined that 23 (62.1%) of the participants had analytical thinking structure and 8 (21.6%) had geometric thinking structure. It was determined that 6 of the teacher candidates (16.2%) had a harmonic thinking structure.

Within the scope of this research, the integral concept representations of the participants were examined according to their thinking structures. Table 2 shows the data of mathematics teacher candidates' preferences for integral concept representation according to their thinking structures.

Table2. Representations Used According to Thinking Structures

Concept	Thinking structure	Response categories	Algebraic Representation		Graphical Representation		Numerical Representation	
			f	%	f	%	f	%
Integral	Analytical thinking structure	Completely Correct Answers	8	34,7	6	26,0	4	17,3
		Partially Correct Answers	4	17,3	7	30,4	5	21,7
		Incorrect answers / Blank answers	11	47,8	10	43,4	14	60,8
	Geometric thinking structure	Completely Correct Answers	2	25,0	4	50	1	12,5
		Partially Correct Answers	3	37,5	2	25,0	2	25,0
		Incorrect answers / Blank answers	3	37,5	2	25,0	5	62.5
	Harmonic thinking structure	Completely Correct Answers	1	16,6	1	16,6	1	16,6
		Partially Correct Answers	2	33,3	2	33,3	3	50,0
		Incorrect answers / Blank answers	3	50,0	3	50,0	2	33,0

In Table 2, it was seen that the participants gave answers to the concept of integral in all types of representation, including algebraic, graphical and numerical representation. In the table, each type of thinking structure was examined

in its own category and frequency and percentage values were written accordingly. For this reason, when the values in each thinking structure are collected separately, 100% has been reached.

First of all, the table was explained according to the correct answers given by the teacher candidates. According to the correct answers of the participants to the concept of integral, it was found that 34.7% of the participants with analytical thinking preferred algebraic representation, 26.0% preferred graphical representation and 17.3% preferred numerical representation.

According to the correct answers given by the participants with geometrical thinking, 50% of them preferred graphical representation, 25% of them preferred algebraic representation, 12.5% of them preferred numerical representation. According to the number of correct answers of the pre-service teachers with harmonic thinking, it was seen that there was a rate of 16.6% in each type of representation. It was found that the most correct answers of the integral concept definitions of the pre-service teachers with analytical thinking were in the algebraic representation, while the pre-service teachers with the geometrical thinking structure had the most correct answers in the graphical representation.

Within the scope of this research, the relationship between the thinking structures of the participants and the number of multiple representations they used was also examined. In Table 3 below, the data of the pre-service teachers who used two or more representations for the concept of integral were given. In this table, the number of representations used by pre-service teachers was also examined according to their thinking structures.

Table3. Pre-service Teachers' Thinking Structures and Representations

Thinking Structure	Dual Representation (Algebraic-Graphical)		Dual Representation (Algebraic-Numeric)		Dual Representation (Graphical-Numeric)		Triple Representation (Algebraic Graphical-Numeric)	
	F	%	f	%	F	%	f	%
Analytical thinking structure	6	26,0	4	17,39	3	13,04	1	4,3
Geometric thinking structure	2	25,0	1	12,5	2	25,0	1	12,5
Harmonic thinking structure	1	16,6	1	16,6	1	16,6	1	16,6

According to the number of representation usage in Table 3, it was determined that the most frequently used binary representation (f=9) by all participants with different thinking structures was graphical-algebraic representation. Algebraic-graphical representation was the most preferred binary representation by participants with analytical thinking. Participants with geometric thinking structure preferred algebraic-graphical and algebraic-numerical representations equally. And finally, participants with harmonic thinking structure preferred an equal number of binary representations among different representation types. In addition, whether the participants used all representations together in their integral definitions was also examined. Considering the participant groups in analytical, geometric and harmonic thinking structures, only one participant from each group showed the concept of integral with triple representation.

Conclusion

In this study, algebraic, graphical and numerical representations were used together in teaching the concept of integral at university level. In this study, which was carried out with the use of multiple representations, firstly, the effect of teaching the concept of integral with multiple representations on the definitions of teacher candidates was examined. Secondly, the effect of teacher candidates' thinking structures on concept definitions was examined.

With a holistic approach, in this study, definitions of the integral concept are presented with algebraic, graphical and numerical representations instead of a single representation. And teaching with multiple representations was also reflected in the answers of the pre-service teachers, they used different representations while defining the concept of integral. Another situation examined in the study was the thinking structures of the participants. It has been observed that the thinking structures of the pre-service teachers affect their representation preferences slightly, if not too much,

while defining the concept. However, it has been determined that there are no sharp boundaries in the types of representation used by participants with different thinking structures. Even though the pre-service teachers had different thinking structures, they used multiple representations in their concept recognition. It can be concluded that this situation has a connection with the use of multiple representations in the lesson in addition to the thinking structures of the participants.

In this study, students' explanations of definitions with different representations and most of their answers being in the category of fully correct and partially correct revealed the importance of teaching the integral subject simultaneously with multiple representations. There are also different studies supporting the results obtained from the first sub-problem of this research. Similar research results also supported the use of multiple representations and showed that the conceptual understanding levels of students who adhere to a single representation type or who do not have the ability to transform between representations may not develop sufficiently (Girard, 2022; Goldin, 200). In another study, it was seen that teaching the integral subject with a single representation caused incomplete and wrong learning (Rasslan & Tall, 2002). Criticizing that the meanings attributed to definite integrals remain at the operational level, researchers stated that the use of multiple representations in problem solving would improve students' conceptual knowledge (Ostebee & Zorn, 1997).

According to the second sub-problem result of the study, it can be mentioned that there is a low level of connection between students' use of multiple representations and their thinking structures. Considering the number of correct answers of the participants, it was seen that those with analytical thinking used algebraic representation, while those with geometric thinking used graphical representation. Krutetskii (1976) also emphasized the existence of different mathematical thinking profiles to ensure a successful performance in mathematics. However, regardless of whether the answers of the participants are right or wrong, it can be said that the different thinking structures of the pre-service teachers do not have a significant effect when viewed only in terms of representation types. In another study, it was concluded that students' solution methods were not related to their spatial-visual and verbal-logical reasoning skills (Hacıömeroğlu, Chicken & Dixon, 2013). This result is similar to the result of the present study. This showed that regardless of the thinking structures of the students, their dominant experiences in the learning process affect their representation preferences in the solution processes.

Considering the results of the current study and other studies in the literature, if the concept is suitable to be presented with multiple representations, it has been seen that using multiple representations contributes to the learning process, regardless of the thinking structures of the learners. Accordingly, teaching the concept of integral with multiple representations has also positively affected the cognitive development of students. The aim of a course should be to explain a concept not with a single representation, but also with multiple representations. And this purpose is also a priority for the analysis course. According to both the views suggested by the educators and the results of this research, teachers should use multiple representations in explaining a concept or explaining a subject if the concept has a structure that can be explained with more than one representation.

Recommendations

As a result, it can be suggested to use multiple representations and to establish a relationship between representations not only in the teaching of the concept of integral but also in the teaching of different contents. In order to gain more comprehensive information about both multiple representations and thinking structures, it is recommended to conduct research on different working groups and different subjects.

Recommendations for Further Research

➢ This research was carried out with 37 pre-service teachers. Similar studies with different sample groups may be recommended.

➢ Similar studies can be carried out within the scope of different disciplines.

Limitations of Study

This study is limited to the teaching the concept of integral with multiple representations on the concept definitions of teacher candidates. In terms of the study group, it is limited to 37 pre-service teachers who voluntarily participated in the research in the 2021-2022 academic year.

Conflicts of Interest

I wish to confirm that there are no known conflicts of interest associated with this publication and there has been no significant financial support for this work that could have influenced its outcome.

Statements of Publication Ethics

This research was reviewed by the Izmir Demokrasi University Social and Humanities Ethics Committee and it was decided that the research was ethically appropriate. Date and ethical decision number: 08/04/2022- 2022/04-02

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The Activities for the Education of the Gifted Young Scientist

Application of design thinking as a differentiation strategy for the education of gifted students: "City X"[1]

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Article Info	Abstract
	This research aimed to apply the City X Project as a 6-hour workshop for gifted students and evaluate the workshop. The study group consists of 25 gifted secondary school students (13 Female, 12 Male) who continue their education at the Science and Art Center (SAC) in a city center in Türkiye. During the application process, gifted students were introduced to the City X project, and information regarding the design thinking method was presented. The story of City X was provided to the students via a digital presentation. The given information was as follows: in the recent past, 40 people from the world were sent to a distant planet to form a colony and these people started to found City X city. City X citizens illustrate the specifics of the issues they face through "citizen cards" in many fields such as health, transportation, safety, and communication to the students and ask them for assistance in addressing the problems. The students are divided into 9 groups that have 2 to 3 participants using the game "Team Meter" during the execution of the workshop. Worksheets, a laptop or desktop computer with an internet connection, citizenship cards, a pen and paper were provided to each group to be used at each stage of the design thinking process. Students selected one of the citizenship cards and used the design thinking method to solve the problem written by the owner of the citizenship card. At the stage of empathy, they evaluated the emotions of the person they selected, and in the definition stage, they defined the social area of the problem raised by the City X citizen. The students later generated ideas for the solution of the specified problem, wrote their ideas on the worksheet, and picked an idea to prototype by group decision. The students prototyped their ideas during the prototyping and testing stages by drawing on the worksheet and completed their creations in various versions by providing feedback to each other. In the sharing stage, 2-dimensional drawings are transformed into 3-dimensional forms via Tinkercad and SketchUp programs. The 3D drawings were saved and submitted to the e-mail address of the City X administrator to be printed on the City X 3D printer. The worksheets used in the design thinking process, three-dimensional models, and the working dynamics of the groups were evaluated by students via Kahoot! web 2.0 tool. The criteria stated in the Kahoot! digital evaluation tools were scored in the range of 1-4 points. The views of students about the workshop were also collected verbally. The students reported that they enjoyed the process of design thinking, that they were pleased to do 3D drawings, that they wished to specialize in 3D design, and that they had several problems with teammates occasionally. One can suggest that the methods applied in the City X workshop can also be included in the course designs within the scope of STEM courses and design thinking methods can be adopted in SAC framework programs.

To cite this article:

Introduction

Gifted students are those who can adapt their knowledge to change settings and enjoy demanding work; they have great recall abilities, imagination, creativity, and motivation (Davis et al., 2014). Giving the gifted students who outperform

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their peers based on their distinctions and needs, the education services they need and allowing them to specialize in their ability sectors is not a duty but rather a requirement (Avcu, 2019). When adequate learning settings are not developed and essential chances are not provided, gifted students may experience several issues (Preckel, Götz & Frenzel, 2010; VanTassel-Baska & Brown, 2007). As a result, gifted students need to be constantly challenged regarding their interests or skill sets. In order to be successful, these students need to be given enriched learning chances in school settings where they may take risks, learn from their errors, and learn to deal with the circumstance when they fail to be successful (Rogers, 2007). Students' cognition and perception are significantly impacted by the lack of enhanced learning opportunities (Kitsantas et al., 2017; Schultz et al., 1997). In addition to providing differentiated instruction and independent activity possibilities in their areas of interest and skill, chances for them to interact with and learn from their gifted peers should be made available (Coleman & Hughes, 2009).

Since learning environments are created for students with typical talent levels, they might not be sufficient to meet the needs of gifted students, who learn more quickly than their peers with average talent levels, enjoy learning that is deep, complex, and abstract, have a variety of interests, and occasionally exhibit irregular developmental stages (Coleman, Miko & Cross, 2015; Fischer & Rose, 2001; Kalbfleisch &Tomlinson, 1998). Research carried out over the past quarter century on the experiences of gifted students in the context of school and education reveals that schools have high success expectations for students and that there are challenges in providing high- and advanced-level learning opportunities for gifted students (Coleman et al., 2015). Gifted children may have unpleasant school experiences due to the mismatch between the teaching methods and their learning styles, which forces them to wait for their colleagues who are learning at a regular pace, gives them too few challenging tasks, and sometimes they are exposed to bullying (Cross, 1997). All of this has the possibility of diminishing the potential that already exists in gifted students and has an impact on their ability to transform their potential into performance, motivation, and success. Differentiation can encourage student motivation and learning. Similar to other special education areas, giving children the chance to maximize their current potential to the fullest extent might open doors to possibilities that will allow them to benefit both themselves and their surroundings.

Based on the differences in students' preparation, interests, and learning profiles, differentiating teaching requires teachers to develop and apply different content, process, and product approaches (Tomlinson, 1995; 2017). Gifted children are not the only ones that need this approach (Gregory & Chapman, 2002). It entails structuring a learning environment that is inclusive for all students in heterogeneous classrooms with students who have a variety of personality traits. In this environment, students discover the content of the program in different ways. Activities and processes are designed so that students may access their knowledge and ideas and engage in meaningful learning. In addition, students are offered options to evaluate their own learning (Tomlinson, 1995). Under the guidance of differentiation principles (tasks appropriate for student level, flexible grouping, quality education program, ongoing assessment processes, learning-supportive environment), teachers utilize a variety of instructional and management strategies based on student characteristics (readiness, interest, and learning profile), allowing them to respond to student needs by differentiating the content, process, and product, as well as the learning environment (Emir, 2021; Tomlinson & Jarvis, 2009).

Tomlinson (1999) notes that several strategies, including stratified teaching, learning contracts, interest learning centers, independent study, teaching with small groups, group research, and other inquiry methodologies, may be used in the differentiation process. The cubing strategy, which enables students to look at a subject from different perspectives and forces students to think at a higher level, the menu strategy, which gives students the freedom to decide on what to do in the classroom, the choice boards strategy, which allows students to master concept teaching and various skills, and the Role, Audience, Format, Topic, Strong verb (RAFTS) strategy, which helps students think about the roles, the target audience, writing style, and the subject they are going to write as writers, are among the other strategies that can be used to differentiate the content, process, product and learning environment (Kaplan Sayı, 2020). As seen in the concept map in Figure 1, differentiation is the proactive response of teachers to student needs shaped by mindset. In this process, many strategies at the bottom of Figure 1 may be used (Tomlinson, 1999; 2017).
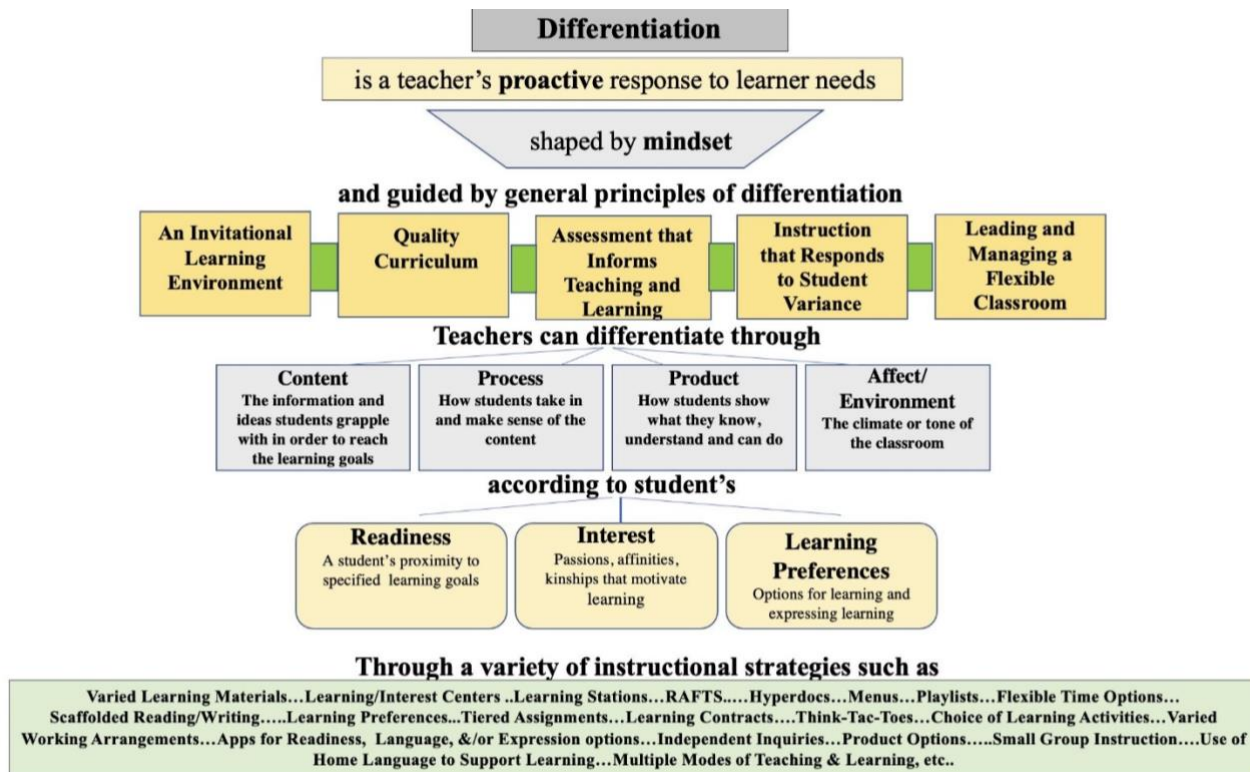
Figure 1. Differentiation Concept Map

Even though a variety of differentiation strategies were discussed in the relevant literature, the distinguishing characteristic of these strategies is that they allow differentiation in at least one of the following dimensions: content, process, product, and environment (Tortop, 2018). In addition, the selected differentiation strategy should

- look interesting to students,
- be directing students to think in higher level thinking steps,
- enable students to use their acquired knowledge, abilities, and understanding, as well as comprehend how these components are related to one another,
- support students to make the best sense of their knowledge and ideas (Tomlinson, 2017).

When the teaching method is implemented in this manner, the amount of information that gifted students can acquire is maximized, and it may also assist to reduce the amount of time and effort that is spent on lower-level courses (VanTassel-Baska, 2003). At this point, it is believed that the most essential thing is to select, execute, and manage the differentiation strategy in line with the criteria provided by Tomlinson (2017) while taking into consideration the learning profiles, interests, and readiness of the students.

To produce innovative solutions to personal, social, commercial, and educational problems, design thinking is a human-centered approach that calls for a thorough understanding of people's needs, in other words, empathizing with the individual and using design tools and the necessary mindset to think design-oriented during this process (Brown, 2008; Kelley & Kelley, 2013, Koh, Chai, Wong & Hong, 2015). The concept of design thinking places a focus on "understanding the needs of a person, also known as the user," as well as conducting experiments, learning from one's failures, developing prototypes, seeking feedback from users, and iteratively redesigning products." (Darbellay, Moody & Lubart, 2017, p.17). The Hasso Platner Design Institute (d.school), which continues its activities at Stanford University, asserts that the design thinking process uses empathizing, defining, ideating, prototyping, and testing to provide creative and inventive solutions to unstructured problems (Bootcamp Bootleg d.school, 2011).

The first step of the design thinking process is to empathize, where the design team may observe the user's everyday experiences, interview the user while interacting with them, and learn more about the user's thoughts and feelings by trying to make sense of the user's experiences (Caroll, 2015). The information gathered during the empathize stage is analyzed and synthesized, and they are then translated into needs and insights at the define stage (Carroll et al., 2010). In the stage of ideation, students initiate the brainstorming process to produce many varied ideas individually or as a group

(Carroll, 2014). During the prototype stage, anything physical that the user can grasp can be created. Presenting tangible products at this point, such as models, drama play, narratives, etc., allows for fast testing and timely improvement of concepts (Odabaşı, Dursun, Ersöz & Kılınç, 2018). The produced prototype is shown to the user during testing which is the last stage when the current solutions are assessed and improved in light of user feedback. Thus, it is aimed to better meet user needs (Carroll, 2015).

Design thinking can be used as a learning-teaching approach (Avcu & Er, 2020; Koh et al., 2015; Lor, 2016; Panke, 2019). At the same time, it is believed that design thinking may be used as a differentiation tool for both gifted and typical students. Gifted students view design thinking as interesting and fun (Avcu & Er, 2020; Avcu & Ayverdi, 2021). Students at normal talent levels also want design thinking to be used in their lessons (Atacan, 2020). In addition, design thinking encourages students to think at a higher level. Each step of the design thinking process encourages creative thinking (Henriksen et al., 2017). Students must use critical and creative thinking abilities, participate in data collecting, editing, analysis, and prototype processes, and monitor and assess their development processes by controlling the team dynamics (Koh et al., 2015).

Students who enter the design thinking process gain 21st-century skills and character traits (Sarıkoç & Ersoy, 2022). According to the findings of their study, VanTassel-Baska and Brown (2007) found that if methods and abilities that can activate multiple higher-level thinking skills are tailored to the subjects being covered in line with the curriculum's essence, learning outcomes for gifted students significantly improve. Using design thinking as a learning-teaching strategy is believed to activate many higher-level skills. Design thinking utilizes active inquiry and conversation, and inquiry-exploration approaches (Walberg, 1991, as cited in VanTassel-Baska, 2003) as the most successful teaching method for gifted students. In the design thinking process, students work on problems, texts, and various materials and create products either individually or as a team. Students have the right to choose for learning and evaluation. These activities provide differentiation of content, process, product, and learning environment according to the peculiarities of gifted students (Maker & Schiever, 2010; Tucker, Hafenstein, Jones, Bernick, & Haines, 1997; VanTassel-Baska & Stambaugh, 2006).

As a differentiation strategy, design thinking can be applied in different contexts such as science education (Atacan, 2020; Çiftçi & Topçu, 2020; Lee, Yoon & Kang, 2014), graphic design (Duman & Kayalı, 2017), social studies education (Aydemir & Çetin, 2021; Koh et al., 2015), teacher education (Carroll, 2014; 2015; Odabaşı et al., 2018; Öztürk, 2020), programming education (Avcu & Er, 2020), STEM education (Arifin & Mahmud, 2021; Avcu & Ayverdi, 2021; Hsiao et al., 2017; Li et al., 2019; Sarıkoç & Ersoy, 2022; Simeon, Samsudin & Yakob, 2022), educational game design (Caferoğlu, 2021), drama education (Polat &Bayram, 2021). Design thinking has been used in many studies concerning the education of gifted students. Ziadad and Sakrneh (2021) presented 77 gifted high school students with 5 problems from science and social studies (water usage for irrigation, waste management, social media addiction, unemployment, awareness regarding bullying, and prevention of it) and offered these students online design thinking training. The research demonstrates that gifted students considered the design thinking approach to be pleasant, engaged in the activities to a high degree, and were more motivated. 22 gifted secondary school students were given the task of redesigning dwellings for people by Avcu and Ayverdi (2021), who used a rubric to assess the students' design thinking skills. The researchers discovered that gifted students enhanced their skills at each phase of the design thinking process as a consequence of doing the activity. Avcu and Er (2020) found that the gifted students used their technical skills and talents, achieved learning outcomes for 21st-century skills, and encountered challenges working with the team as a consequence of the 30-hour design thinking practice. However, it was also recognized in this research that gifted students effectively utilized technology, and digital tools in particular, throughout the design thinking prototyping phase.

While design thinking is used as a differentiation strategy for gifted students, the process can benefit from technology. Technology also referred to as the "great equalizer," is a suggested method for differentiating educational programs and teaching for gifted students (Avcu & Yaman, 2022; Periathiruvadi & Rinn, 2012; Sprague & Shaklee, 2015; Siegle, 2014; Tomlinson, 2017). It is commonly acknowledged that technology has the potential to improve the efficacy and quality of education for gifted students, and some scientists assert that some technologies, such as the internet, 3D

design, and programming, are especially advantageous for gifted students (Pyryt, 2009; Shavinina, 2009; Siegle, 2005). Gifted students also state that they want to learn 3D design, programming, animation, and how to use new technologies (Öngöz & Aksoy, 2015). The use of technology in the education of gifted students has three main functions: enabling (performing the tasks), developing (improving the works) and transforming (doing things differently) (Chen, Dai & Zhou, 2013). In the stages of the design thinking process, digital differentiation can also become possible with technology benefiting from these functions. With digital differentiation, the learning process of students may be enhanced by the use of fundamental questions for developing adaptable learning paths and digital resources (Kaplan Sayı & Soysal, 2022).

In this study, design thinking has been seen as a differentiation method that can be used to differentiate the dimensions of content, environment, process and product in the education of gifted students. During the prototyping phase, students were enabled to develop 3D models using digital drawing tools. 3D technologies have an important place in the development of students' knowledge and skills. With these technologies, students can design a new project as well as design products for the projects they are working on and make these products concrete (Akyol, Uygur & Yanpar-Yelken, 2022). In this context, digital differentiation has been applied with the effective use of 3D technologies. With the assistance of design thinking, it is intended for gifted students to come up with inventive answers to unstructured problems in a social setting while leveraging their problem-solving, creativity, critical thinking, 3D technology, and STEM (science, technology, engineering, and mathematics) skills.

Purpose of Study

This research aims to apply the City X Project as a 6-hour workshop for gifted students and evaluate the workshop. City X is a workshop developed by Stanford University that aims at teaching creative problem-solving and 3D technologies to children aged 8-12 using design thinking. Materials related to the City X Project can be found at http://www.cityxproject.com/. Permission was obtained from the project developers via e-mail to implement the project, adapt it for gifted students in Türkiye and share the results for academic literature. The learning outcomes aimed to be achieved by the students participating in the City X workshop are as follows:

 ➢ Develops an original project using the design thinking process (design project development- all stages)
 ➢ Creates his/her design to achieve the goals that were set in the 3D programs (Information technologies-prototyping phase)
 ➢ Compares two or more characters, settings, or events in a story or scenario to demonstrate their differences using particular literary elements (e.g. how the characters interact) (Linguistics-empathize stage)
 ➢ Combines information collected from multiple printed and digital sources avoiding plagiarism (Linguistics-ideate stage)
 ➢ He/she makes efforts to solve the problem previously identified (Mathematics, defining, ideating stages)
 ➢ Performs mathematical modelling (Mathematics, prototyping phase)
 ➢ He/she tests the accuracy, certainty, and precision of the model that was developed (Mathematics, testing phase).

The targeted learning outcomes in City X Project can also be associated with achievements in the field of science. Students may use their knowledge of ecosystem components for the City X Project in this context. They may draw a map of City X or the planet it was constructed on, highlighting various aspects. They may share knowledge of the planet's inhabitants, both living and non-living. Students can then use this information to further improve their ideas for design solutions. Examining the teacher guidebook (http://www.cityxproject.com/toolkit/) reveals how City X's achievements might be related to other fields such as history besides science.

Study Group

The study group consisted of 25 gifted secondary school students (13 Female, 12 Male) who continue their education at the Science and Art Center (SAC) in a city center. The mean age of the students was 12.

Application Example: City X

The six-step design thinking strategy used in City X (empathize, define, ideate, prototype, test, and share) is an adaptation of the design thinking process applied by Stanford d.school. The stages of this process were given in Figure 2.
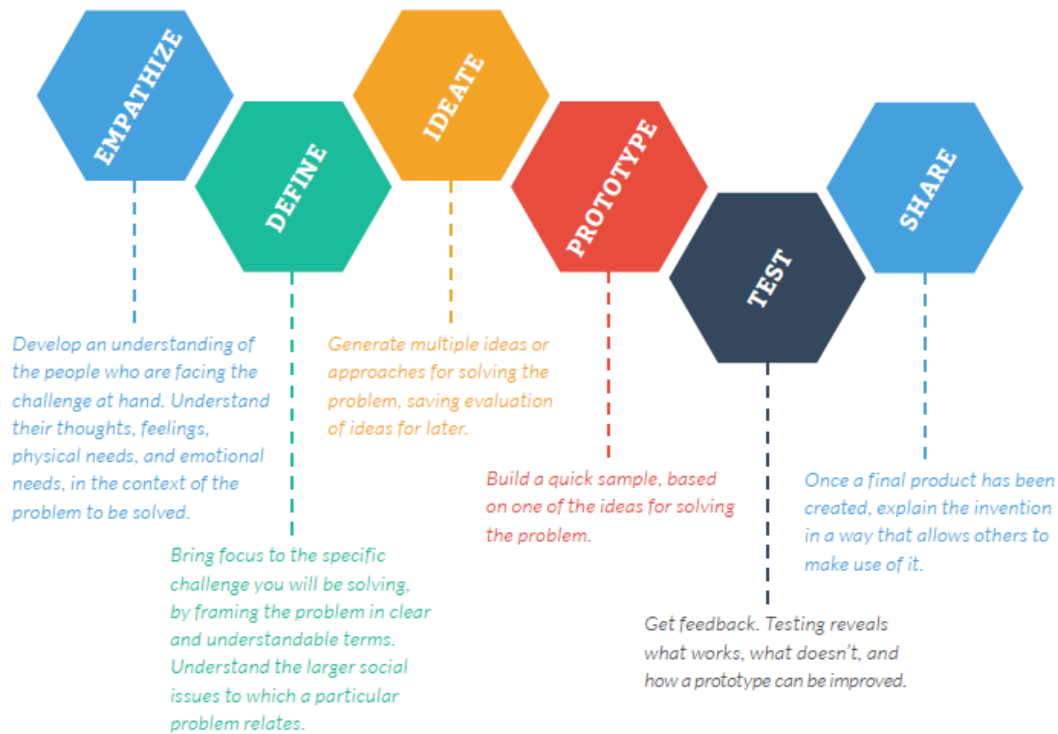
Figure 2. Stages of the Design Thinking Process Used in City X

When Figure 2 is examined, it is seen that the stages of the design thinking process follow the stages of empathize, define, ideate, prototype, test, and share. Unlike the stages of the Hasso Platner Design Institute (d.school), the sharing phase was applied in City X. At this stage, students send the 3D models they have developed to the mayor of City X via e-mail. The materials used in the implementation of the workshop are as follows:

➢ Digital Presentation
➢ Team Meter Game
➢ Citizenship Cards
➢ Empathize -Define Worksheet
➢ Ideate Worksheet
➢ Prototype-Test Worksheet
➢ Sketch Worksheet
➢ 3D Drawing Program (Sketch Up and Tinkercad preferred) and Computer, Internet Connection
➢ 3D Printer (If Possible)

Application Steps

During the application process, gifted students were introduced to the City X project, and information regarding the design thinking method was presented. The story of City X was provided to the students via a digital presentation. The given information was as follows: in the recent past, 40 people from the world were sent to a distant planet to form a colony and these people started to found City X city. City X citizens illustrate the specifics of the issues they face through "citizen cards" in many fields such as health, transportation, safety, and communication to the students and ask them for assistance in addressing the problems. The students were divided into 9 groups that have 2 to 3 participants using the "Team Meter" game during the execution of the workshop. Team Meter Game was presented in Figure 3-a and citizenship cards were presented in Figure 3-b. The problems experienced by different City X citizens included in the citizen cards, and some examples of these cards were given in Annex-1.

a   b

Figure 3. Team Meter Game and Citizenship Cards

First Stage: Empathize and Define

At this point, students read the problem of the City X citizen they selected by consensus with their peers and define their problem by empathizing with that individual. At this stage, the worksheet given in Figure 4 was used. A sample worksheet filled by the students during the application process was also presented in Figure 5.

Figure 4. Empathize -Define Worksheet

Victoria is feeling tense.

Victoria needs me to design a solution to a social problem about energy.

Figure 5. Example of a Worksheet Filled in By Students to Empathize and Define

Second Stage: Ideate

At this stage, students provide solutions to the problem highlighted for the citizen of City X. In this process, the rules of brainstorming and the rules related to this stage were reminded to the students. An Ideate worksheet and a sample worksheet filled by the students were given in Figure 6 and Figure 7.

Figure 6. Ideate Worksheet
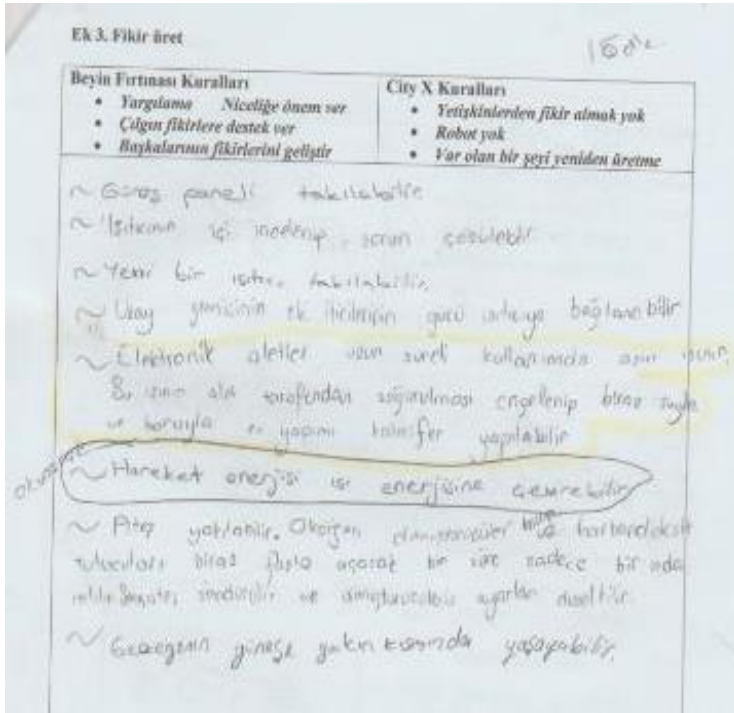
Solar panel can be installed.

The inside of the heater can be examined, and the problem can be solved.

A new heater can be installed.

The power of the spacecraft's additional thrusters can be connected to the heater.

Electronic tools overheat during prolonged use. By preventing the gamma ray from being cooled by the instrument, a homemade heater can be made with some water and a pipe.

Motion energy can be converted into heat energy.

Fire can be lit. By turning on the oxygen converters and carbon dioxide scavengers a little too much, only one room is heated for a while. Then the fire is extinguished, and the coolers correct the settings.

It is habitable on the part of the planet close to the sun.

Figure 7. Example of Ideate Worksheet Filled in By Students

Third Stage: Prototype-Test

At this stage, students pick one of their collectively generated ideas and go on to the prototype stage. After concretizing their concepts, students get feedback from their peers and test their prototypes. They can give feedback to the drawings using icons suggesting "good idea, I have a question, needs a change". In this process, the prototype was developed in three versions. The worksheet and sample student worksheet for this stage were given in Figure 8 and Figure 9.
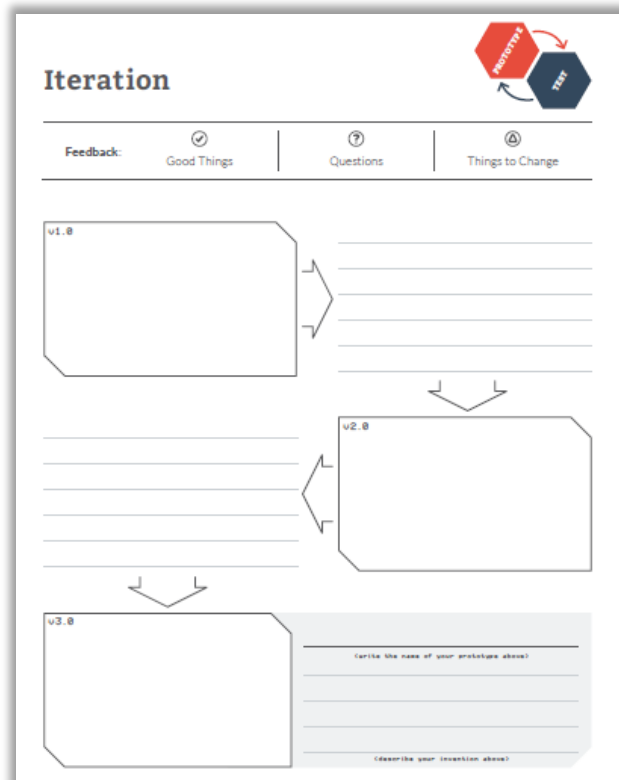
Figure 8. Prototype-Test Worksheet

Tribunes, water return, generating energy without wasting any energy. What will work with a final star? What will it focus on? More grandstands and what material to concentrate?

More energy and cooler with more stands.
How does the incubator work?
Long and thin pipes to increase the pressure.

Name of Prototype: Intensehydro 3.0
Our prototype heats our system by condensing the rays coming from Alpha, which receives the sun of planet X, and which have high temperatures since there is no atmosphere. The heated water evaporates and turns the turbines, and when it reaches the top, it turns into a liquid again with a late-heating substance consisting of the combination of the elements on planet X and turns the tribunes again, reaching the same part again and circulating.

Figure 9. Example of a Prototype-Test Worksheet Filled in by Students

Fourth Stage: Share

Students then draw the 3D version of the prototype they have created. They scale their ideas from the front, side, and top. Here, it is not necessary to sketch in great depth. Students transform their prototypes into a three-dimensional format using 3D drawing programs. The students then save their 3D drawings in "stl" format and submit them to the teacher's email address. Following the City X scenario, students send their e-mails to the Mayor of City X. If a 3D printer is available, student drawings will be printed. Students observe the process and products. The sketch worksheet of the sharing phase was given in Figure 10.
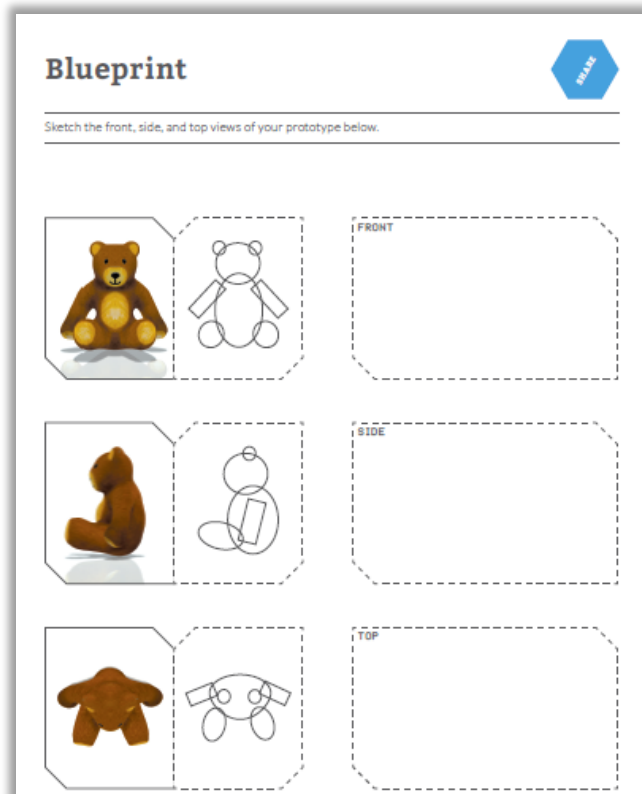
Figure 10. Sketch Worksheet

Figure 11 depicts the visuals associated with the students' three-dimensional drawings, whereas Figure 12 depicts the visuals associated with the student's learning environment and process. In Figure 13, explanations regarding the 3D models of the students were given.
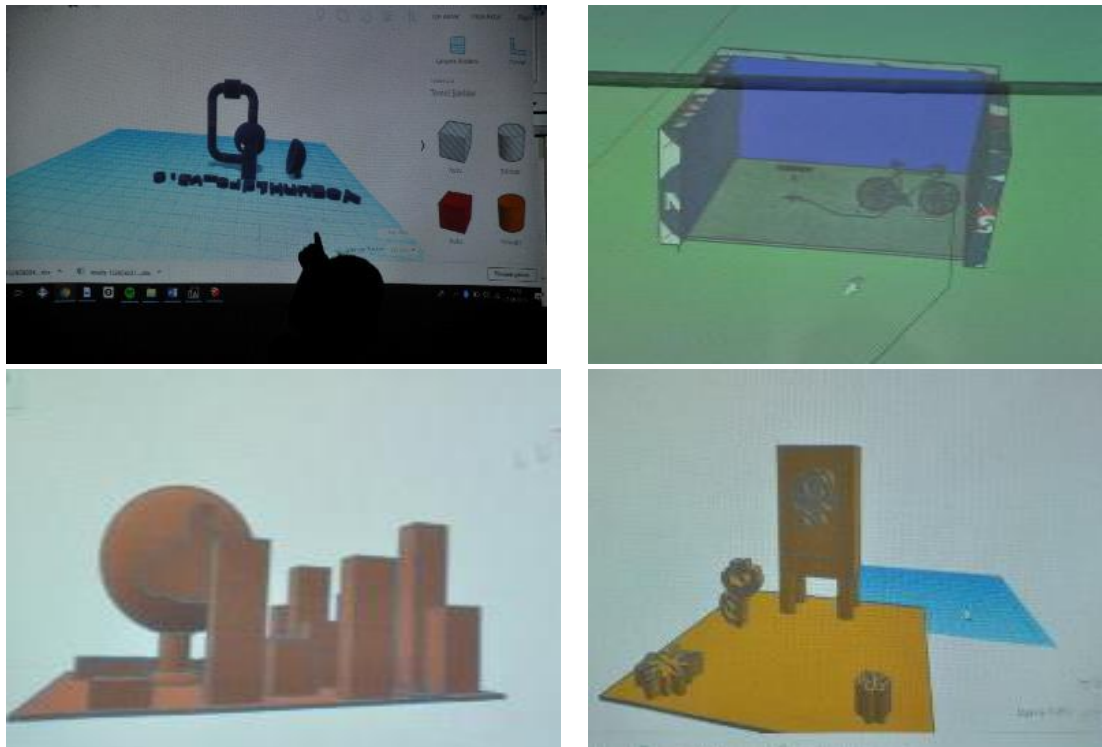
Figure 11. Example 3D Drawings Created by Students

Figure 12. Study Environment

a   b   c   d
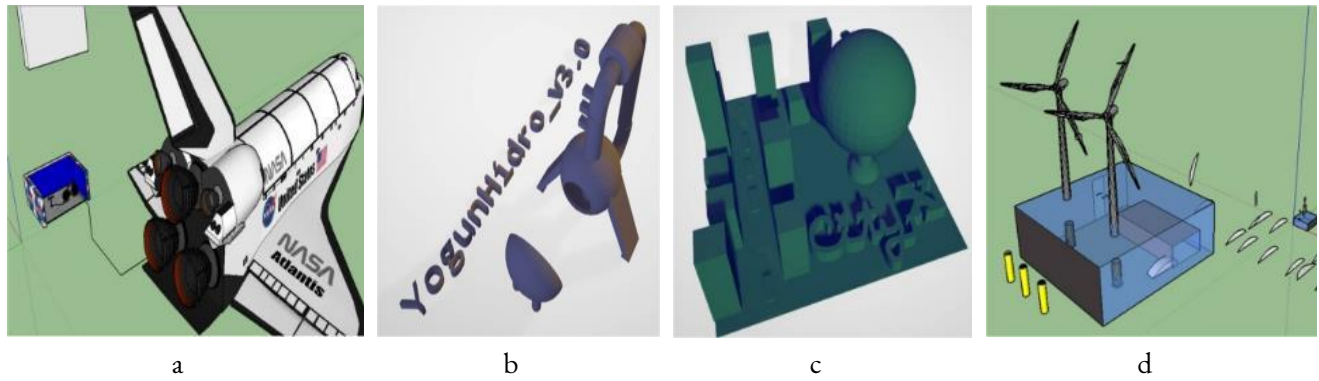
Figure 13. Three-Dimensional Models

Figure 13-a depicts the solution that students created for Pim's issue of living in City X during the design thinking prototype phase. The problem of Pim was about the darkness of nights, not how long they are because this was interrupting daily works. The students created a renewable system by combining the solar panel with their weathercock. Figure 13-b shows a structured design that would enable Tim to remember the world where he comes from and can feel at home when he misses the world. In Figure 13-c, students created a prototype for Victoria, who was worried about the declining energy of the space shuttle. In the intensehydro 3.0 prototype, there is a section that heats the system by condensing the rays from Alpha, the sun of Planet X, which are very hot due to the absence of an atmosphere. The heated water evaporates and spins the tribunes; when it reaches the portion above the tribunes, it reverts to a liquid with a less heat-conductive material composed of the combination of elements on Planet X, and then it drops. Thus, the tribunes rotate and recirculate again. In the last prototype 13-d, students solved Marek's problem of feeling cold by installing a small bicycle inside the spacecraft and connecting it to the heater's engine. When Marek rides the bike, the heater turns on and the energy problem will be solved.

Measurement and Evaluation

The worksheets used in the design thinking process, three-dimensional models, and the working dynamics of the groups were evaluated by students via Kahoot! web 2.0 tool. Besides, the views of students about the workshop were also collected verbally. The criteria stated in the Kahoot! digital evaluation tool were scored in the range of 1-4 points. The worksheets used in the design thinking process, three-dimensional models and the working dynamics of the groups were evaluated by students via Kahoot! web 2.0 tool. The questions used in the evaluation tool are as follows:

- ➢ The empathy map was carefully filled in
- ➢ The design team has produced several ideas for the solution
- ➢ The development stages of the prototype are clearly seen in the drawings created by the design team
- ➢ The design team has successfully identified the functioning and problematic parts when prototyping
- ➢ The three-dimensional design looks interesting, and the features of the design were well described
- ➢ The design provides solutions to the problem of the City X citizen
- ➢ The design team worked collaboratively
- ➢ The design was the collective idea of the team
- ➢ There was good communication within the design team
- ➢ The design has been presented successfully

Conclusions and Recommendations

Owing to the City X workshop, gifted students experienced the DT process and completed it in teams. Peer reviews conducted by students using the web 2.0 platform Kahoot and their comments showed that they enjoyed the experience, were interested in 3D design, and also had difficulties collaborating with the team. It was observed that the mean score of the groups was 34.6 out of 40.

The groups' scores on the items pertaining to teamwork were the lowest. In a similar vein, Avcu and Er (2020) found that the gifted students used their technical skills and talents, achieved learning outcomes for 21st-century skills, and encountered challenges working with the team as a consequence of the 30-hour DT practice. When gifted students engage in design thinking activities, they also hone their skills related to each stage (Avcu & Ayverdi, 2021). Ziadad and Sakrneh (2021) reveal that gifted students were happy to receive education through the design thinking process, active in design thinking activities highly, and their motivation increased. Additionally, students with typical ability levels express a desire to continue taking part in design thinking activities (Atacan, 2020).

The gifted students' difficulties with teamwork throughout the design thinking process may have been driven by their desire to demonstrate their leadership qualities (Davis et al., 2014). Similar results regarding the difficulties of working as a team in the design thinking process were also obtained in the studies of Avcu and Er (2020), Santos Ordóñez, González Lema and Miño Puga (2017) and Retna (2016). In addition, Dukes and Koch (2012) stated that students enjoyed applying the design thinking process as mentioned in the current study's results.

In this study, it was noticed that students used their knowledge in STEM subjects and adapted this information for problem-solving while using the design thinking process to provide answers to the problems of City X citizens. When choosing from citizenship cards, students chose the problems related to STEM fields. It is believed that students' enthusiasm and good attitudes toward STEM subjects have an influence on this circumstance. As a teaching approach, STEM and design thinking have processes that support each other. Similarities exist between the engineering design cycle used in STEM activities and the design thinking approach (Ayverdi, 2018; Avcu, 2019). In addition, STEM education improves students' design thinking and teamwork skills, as well as boosts their imagination and curiosity (Yıldırım & Türk, 2018). Teachers also believe that STEM applications improve students' design thinking and creativity skills (Taktat Ateş, Saraçoğlu & Ateş, 2022). At the same time, the design thinking process can be used in STEM education (Arifin & Mahmud, 2021; Avcu & Ayverdi, 2021; Hsiao et al., 2017; Li et al., 2019; Sarıkoç & Ersoy, 2022; Simeon, Samsudin & Yakob, 2022). The City X workshop may also be seen as an exploration that combines STEM teaching with design thinking.

The creators of the city X workshop had originally envisioned a three-day workshop; however, this work was redesigned as a six-hour program. In this process, design thinking was applied as a technique for differentiating gifted students, and digital differentiation was accomplished via the use of 3D drawing and internet technologies. Planning and time management were major topics for consideration during the workshop. When implementing the City X workshop, consideration was made to the amount of time allocated to students at each stage. Occasionally, requests for more time were also granted, but no substantial changes were permitted. The application process was facilitated by the preparation of worksheets and materials, the practitioners' existing work with their own students, and their expertise in implementing design thinking activities. The evaluation process took longer than anticipated, necessitating extra time. Girgin (2019) determined that teachers had difficulty in time management, empathizing, and ideating. Gaitas and Martins (2017) listed the five challenges teachers face while implementing differentiated teaching as follows: i) activities and materials, ii) evaluation, iii. classroom management, iv. planning and preparation, and v. classroom environment. Most teachers in conventional classrooms perceive differentiation to be a difficult method (Smets & Struyven, 2020). It is believed that the implementation of this study at SAC, which is an after-school enrichment program, would simplify the differentiation process owing to the environment's flexibility and the presence of teachers with years of experience engaging with gifted students.

Recommendations

Regarding the implementation process of the City X workshop, practitioners may be encouraged to pay close attention to time planning and management, as well as to meticulously prepare and review the materials in advance. The evaluation process should be meticulously planned, implemented and managed. In this study, students' verbal statements and peer evaluation were taken into account. A variety of alternative evaluation methods, including design thinking rubrics and teacher observation forms, may be used to make evaluations. When researching gifted students, it is important to include

their leadership qualities as well. It has been recommended that the City X workshop implementation approach to be employed in the course designs being developed for STEM courses, and that design thinking would be included in the SAC framework programs. The application process is expected to be more effective owing to teacher training in differentiation, digital differentiation, and design thinking.

Limitations of Study

This study is limited to a 6-hour adaptation of the City X workshop and its application to 25 gifted students. Assessment and evaluation processes are limited to the evaluation of the activity and teacher observations.

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Conflicts of Interest

I wish to confirm that there are no known conflicts of interest associated with this publication and there has been no significant financial support for this work that could have influenced its outcome.

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Appendix 1. Examples of Citizen Cards

Alfie
Night lasts a long time here and we're having a hard time growing food.

Adam
My tooth is loose but it won't come out and now it hurts.

Barbara
We don't have schools here. How can my friends and I learn?

Cooper
My friend doesn't feel well. How can I find out what's wrong with him?

Ali
We started a research station on the other side of the planet. How can we get back and forth from City X faster?

Allessia
I want to visit my cousin on the other side of this river but Mom said I'm not allowed to swim across.

Daniel
This new planet has different germs and viruses. How an we keep ourselves healthy?

Emilia
There's already a lot of traffic and noise in City X. How can we make it better?

Helen
I have a question for Hugo but he speaks a different language than me. How can we talk to each other?

Hugo
We don't have any police here in City X. How can we help people live together peacefully?

Jana
We've been working really hard to build City X and I'm tired! I'm afraid we won't get everything done in time!

Juan
There's not enough healthy land to grow all the food we need here.

Ida
Some of the food in our storage containers has started to rot.

Ilya
Accidents happened too often on Earth. How can we make ourselves safer here?

Li
On Earth people use a lot of wood to build things but we don't want to destroy the forests on our new planet.

Malika
My friend is trying to grow plants but she has to carry water all the way from the river in buckets. How can I help her?

Check for updates
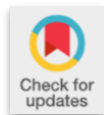
Research Article

The political nature of education and political placements in the struggle of hegemony in education[1]

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Article Info	Abstract
	The modern political understanding defines politics only within the boundaries of a political society immanent to the state, such as parliament and political parties. Within the framework of this understanding, it is discussed whether education is included in the political field. In this direction, although formal education is planned under the control of political powers, they are trying to define it outside the political field and turn it into a unilateral hegemony device. As this limited definition of the political, the importance of civil society in politics began to increase, the political struggle first expanded to the field of hegemony between civil society structures such as Trade Unions, and then the borders of the political expanded from the field of the state to the entire social field, especially within the framework of Foucaultian biopolitics and understanding of power. As a matter of fact, Foucault draws attention to the emergence contingency of the power relation wherever there is a mode of subjectivity in a relationality while revealing himself in the subject, instead of positioning the power in the field of the state alone. Thus, wherever the power is, there is the opportunity for resistance to emerge and the boundaries of the political to expand (Foucault, 2014). In this framework, the expansion of the borders of the political sphere towards the social sphere destroyed the one-sided perception of the concept of hegemony under the control of the state or the ruling class, and with the influence of Gramsci (1999), the concept of counter-hegemony and the struggle for hegemony emerged. The field of education should be understood as a field of political struggle as it contains many political confrontations that conflict with each other, such as power, education trade unions, education policies, educational designs such as teachers, students and families. Thus, the field of education appears, on the one hand, in the structural political struggle between the political power and "Education Trade Unions", and on the other hand, as a field of hegemony that includes particular subject movements and political subject positions, such as students and teachers.

To cite this article:

Introduction

In general terms, education is defined in a position above politics and outside the political realm (Samuel&Mantel, 1956). Nevertheless, as our perspective on what the political is develops, the potential to see the education included in the political field would appear. The modern political approach defines politics only within the scope of the political society within the domain of the state, such as the parliament and political parties (Cohen&Arato, 2013). In the context thereof, whether education is included in the political field is considered controversial. Accordingly, although formal education was planned under the control of political powers and maintained an ideological character in the respect thereof, there has been a persistent effort to define the same outside the political field by the political powers and to turn it into a unilateral hegemony device.

The aforementioned limited definition of the political was challenged especially within the framework of Foucaultian approach towards biopolitics and power, and the borders of the political expanded from the state to the social sphere. As

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a matter of fact, Foucault considered power as a multiplicity of power relations spread over the entire social relations, but not positioned in the sphere of the state alone. Power is omnipresent, but this is not because of the wide spectrum of its sphere of influence or that it is all-encompassing, but because power relations appear everywhere. From the point of view, power reveals itself in the subject. Power is not vested a central position in historical and structural terms, and is composed of institutions and apparatuses. So, wherever there is a mode of subjectivity in a relationality, there emerges the contingency of the power relation. Thus, wherever the power is positioned, there is the opportunity for resistance to emerge and the boundaries of the political to expand (Foucault, 2014).

Accordingly, the perceived expansion of the borders of the political sphere towards the social sphere, the concept of hegemony unilaterally under the control of the state or the ruling class was destroyed and it was seen that the concepts of counter-hegemony and struggle for hegemony emerged also with the influence of Gramsci (1999). As a matter of fact, Laclau and Mouffe take Carl Schmitt's distinction between friend and foe and the conflictual nature of politics as a point of departure and identify the political as a kind of antagonism that spread to the social sphere. Thus, politics is shaped by the antagonistic struggle of opposing discourses.

A similar antagonism is included in Rancier's definition of the political. According to Ranciere, the political is the confrontation of two processes of two distinct types as ruling and equality. In the light thereof, political is where the respective laws of Polis (administration) and egality (demos) meets as the law of organization of public order and governing. To consider the political as an antagonism of us and them or rulers or ruled in fact allows us to more clearly see a number of channels in the social sphere, which are originally political, and indicate the educational sphere as such an antagonism, i.e. a political sphere (Laclau, 2007; Mouffe, 2010; Ranciere, 2007).

The field of education should be understood as a field of political struggle as it contains a number of conflicted political confrontations, including the political power, trade unions, education policies, curriculum, teachers, students, and families. Therefore, it can be suggested that the field of education emerges as a field of hegemony struggle that includes particular subjectivity movements and political subject positions, including students and teachers, as well as structural struggles. In the framework thereof, the present article will study the political nature of education and the potential for the emergence of political subject positions that can take place in the struggle for hegemony in the field of education.

Problem of Research

The main problems of the study are stated below. According to this;

➤ Why does education have a political nature and what kind of a struggle for hegemony exists between the components of this political process?

➤ What kind of political subjectivation potential do structural political components such as political powers and trade unions and non-structural social subjects such as educators and students have in this struggle for hegemony?

Method

Research Design

In the field of education policy, the research aims to draw the boundaries of the political nature of education and the phenomenon of hegemony in education and to bring a critical approach to how it works, by researching the sources in the domestic and foreign literature on how the political nature of education and the struggle for hegemony in education work. For this purpose, the "literature review method" (Kızıltepe 2015), one of the qualitative research techniques, is used in the research.

Results and Discussion

In this section, it will be discussed why education has a political nature, what the political actors may be in the political process of education, what kind of hegemony struggle may take place among these actors, and how the components of the education process have a political subjectivity potentials.

The Political Nature of Education and the Struggle for Hegemony in Education

The modern political approach defines politics in an area immanent to the state, just within the boundaries of the political society, such as the parliament and political parties. Accordingly, it has been debated whether education is included in the political field. Therefore, although formal education was planned under the control of the political power and has an ideological character in that respect, there is an ongoing persistently effort by the political power itself to define the same outside the political realm. Thus, the aim has been to keep education away from politics and the political struggle of social segments, but make it serve as an area where the power would maintain the liberty of control. This approach transforms education into a unilateral hegemony device in favor of political power.

The aforementioned limited definition of the political was contested when the political struggle expanded to the field of hegemony struggle between civil society structures and the importance of civil society in politics increased especially with modernism (Cohen&Arato, 2013: Keane, 1993) and gradually it has been transcended within the framework of Foucaultian biopolitics and understanding of power, and therefore borders of the political expanded from the state to the social sphere. As a postmodern political strategy of the capitalist state, it was aimed to reproduce the power with an inclusion strategy that would include civil society through the demonstration of democratic participation, where the decisions are taken via participatory methods and the entire civil society is included, and by creating a great neo-corporatist machine (Schmitter, 1974), resulting in the fact that the state as Gramsci stated, becomes an expanded state (Thomas, 2010).

The Foucaultian idea that 'power is everywhere in every sense' also expands the areas of confrontation with power. Therefore, the universal discursive influence of power can never fully establish hegemony over the molecular space; otherness is complete otherness and includes absolute 'differance'. Thus, a contingency emerges thanks to this ontological non-coincidence phenomenon (Butler & Laclau & Zizek, 2009). Contingency hands over the direction of particular movement to anarchy; in other words, the movement of particularity can never be determined, it is an otherness in itself. In the Derridean sense, it won't be spoken (Derrida, 1999; 2010), it always deviates from the envisioned universal, revealing a movement of political subjectivity that cannot be determined in the molecular sense. Laclau suggests that such a phenomenon of non-coincidence is a social particularity taking on the representation of a universality that would never fully coincide with itself, that is, as the condition of hegemony. Therefore, each particularity will always have the potential to be re-incorporated into a new universality. This suggests a struggle for hegemony over universal discourses (Laclau & Mouffe, 2008).

Contingency creates, in this sense, an open arena for the struggle of a number of political figures or groups, who seek to build hegemony through their own universal discourse against the hegemony of power, universality or homogenization in the political arena. In the context thereof, different socio-political groups compete fiercely to ascribe a temporary, albeit temporary, universal representation function to their particularism according to Laclau. Society generates a whole glossary of empty signifiers; how they would embrace a signified or a meaning is a matter of political competition (Laclau, 2003).

Accordingly, the main determinant and central category of the political relationship is hegemony. Different colors, values or ideological positions that make up the society are in political competition for the acceptance of different ideas, and the foregoing competition takes the form of a struggle for hegemony in the field of discourse. The occurrence of the masses fixed in the discursive field, on the other hand, shows that the hegemony process is working. Therefore, the democratic politics, according to Laclau and Mouffe can only be possible with a political possibility in which different discursive totalities can struggle in accordance with the very antagonistic nature of society, and social particularities can be freely articulated into any of those discursive totalities (Laclau & Mouffe, 2008).

Nevertheless, while the expansion of politics into the field of civil society and transcending the modern civil society - state duality, or non-separation of the state from civil society and the politics from bare life, in fact gives a rise to a biopower approach, in which the control of politics infiltrates all the cells in the depths of society, as well as daily life, thus leads to a kind of new totalitarianism (Agamben, 2013), it also makes it possible for us to conceive of an innate

understanding of resistance against this innate understanding of power, as well as an area that has the potential to weave the field of civil society as an area of resistance against power (Hardt &Negri, 2011).

In the framework thereof, the field of civil society becomes a political field, where the control of the state infiltrates and expands, but precisely for this reason, it creates the possibility of resistance by politicizing the entire social field. The politicization of civil society transforms the associations pertaining to the field of civil society, including trade unions, parties, or associations, which do not look to have a political character, into a tool for hegemony by instrumentalizing the state's control, management, and persuasion mechanism, but on the other hand, it was able to transform it into organizing a resistance in other words a counter-hegemony mechanism against the system by attracting such civil society associations to the political arena. The expansion of the political sphere and its transformation into a field of contingency introduces a field of struggle for hegemony. Here, education can be conceived as one of the areas of struggle for hegemony with an aforementioned political nature, and in that sense, politics is not only a monopoly of the state, parties, or trade unions, but also in an expanded view as a hegemony of power and at the same time the possibility of resistance via an approach that all the components of education participate, for example, teachers can be political subjects. In that respect, as in all areas of society, the expansion of the political beyond the structural boundaries in the field of education means the expansion of power and the construction of hegemony, as well as the result of dialectical inevitability, which also means the possibility of resistance and counter-hegemony (Kükürt, 2020).

Therefore, the area of political struggle also expands to the extent that the area of power expands. Accordingly, the expansion of the borders of the political sphere towards the social sphere has destroyed the unilateral perception of the concept of hegemony as under the control of the state or the ruling class. Therefore, Gramsci's idea of counter-hegemony (Gramsci, 1999; Bobbio & Texier, 1982), could be reinterpreted within the framework of an enlarged biopolitics and allowed the extension of the concept of hegemony struggle from political society to civil society, and then to the depths of institutional and personal relations. Thus, the political relationship has the potential to appear as an antagonism in each field of intersubjectivity.

As a matter of fact, Laclau and Mouffe take Carl Schmitt's distinction between friend and foe and the conflictual nature of politics (Schmitt, 2006) as a point of departure and identify the political as a kind of antagonism that spread to the social sphere. Accordingly, politics is shaped by the antagonistic struggle of opposing discourses. This political perception is indicative of the fact that the struggle for hegemony has spread to all areas. Notwithstanding the fact that the said political approach expands the field of politics, it is still associated with political struggle perceived as structural, that is, as a struggle between structures (union, or education trade unions, organization, party, group, etc.) innate to civil society. However, based on the idea of bio-politics and antagonism, the present study suggests that along with the structural functioning of the political, it can also present in (deconstructive) personal processes that can be manifest between spouses in a family, or even between teachers and students in a school. The political nature of the field of education should be perceived in this context.

The Potantial of Political Subjectivation in Education

Foucault sees power as a multiplicity of power relations that spread over the whole of social relations, rather than positioning it only in the realm of the state. Power is omnipresent, but it is omnipresent not because of the magnitude of its area of effect or omnipresence, but because power relations appear everywhere. From a Foucaultian point of view, while power opens up itself in the subject, instead of placing power in a certain historical and structural central position consisting of institutions and devices, the contingency of the emergence of the power relation stands out wherever there is a mode of subjectivity within a relationality (Foucault, 2014). Thus, wherever the power is, there is the opportunity for emergence of resistance and the expansion of the boundaries of the political (Foucault, 2015).

Nevertheless, this is not to indicate that a central power has completely disappeared. Contrarily, it is indicative of the fact that forms of power can be present both in central and institutional terms, and even in intersubjective personal processes. In this framework, the political begins to emerge both through structural politics, but also in all institutional and intersubjective personal processes innate to society. Furthermore, the "political" and "political struggle" conceptions in the present study is suggestive of the fact that political subjectivity can be manifest not only between larger structures,

but also in particular or molecular relationship processes. "The private (personal) is political" (Hanisch, 1969) motto, which has become an important feminist slogan today, should be perceived in this context as well. Accordingly, Ranciere's understanding of the "political" offers a more convenient set of concepts for comprehending the potential of the political to emerge even in personal processes. Ranciere's definition of "political" also takes a similar idea of antagonism as a point of departure. In the light thereof, political is where the respective laws of Polis (administration) and egality (demos) meets as the law of organization of public order and governing. Therefore, the political refers to the phenomena of egalitarian opposition to injustices that appear in the process of domination. In a sense, for Ranciere, politics is this process of emancipation that is innate to the principle of equality. In the context thereof, for the purposes of the present study, the police-demos encounter is perceived not as a mere structural encounter, but as a molecular antagonism that can be manifest in all social relations, personal processes, even in the family and at school.

Thus, the field of education is not merely a realm for structural struggles of organizations, including unions or parties, but it can also be identified as a field of such molecular struggle, as a political field. Therefore, the field of education should be considered a field of political struggle, hosting a number of structural and personal political encounters, the educational designs of which are in conflict with each other, including political power, education trade unios, educational policy, teacher, student, and parents. This is because of the fact that as long as education is considered mass education, it is seen as the process of bringing in a behavioral change in a certain direction in the individual or group being educated (Aksoy&Eren, 2017). In this sense, an educator is in an effort to administer and control a group of students and to shape them based on the principles of the law of polis embodied in her/him as delegated via the senior management (Dewey, 1996). In this sense, education primarily indicates a political process in terms of student and teacher encounter. Nevertheless, the fact that education is a political phenomenon, is not limited to above but also embodies a number of increasingly complex polis vs. demos encounters within the process of governing and being governed (Ranciere, 2007).

It can be suggested that education is a political process on the grounds of the political antagonism processes in education, political power policies and its practitioners (such as school, school administration and teachers), political power and education unions, power policies and school administration, teachers and students in terms of the continuation of many more structural and personal antagonistic relations.

In that respect, the operation of the political process does not merely occur in the state-society-individual relations, in the institutional structures within the state or in the institutional associations within the civil society, but also in each institutional or non-structural relational area immanent to the society. Accordingly, the process of political subjectivation occurs in terms of being involved in the relationship of being governed and overturning the principles of governing in all the power formations that are inherent to the state and society.

For example in the educational process, the fact that the political power aims to keep the target group (under education) together as a 'congregation' and to create a monolithic nation out of it, imprisons the educator, that is, the teacher, as a part of the power's way of maintaining politics, and forces the teacher to be a tool of greater motivation of polis. In this sense, the field of education appears as a political process in which the state power 'fixes' the society in the desired direction under a certain identity and in the meanwhile seeks to instrumentalize not only the students but also the teachers as part of its own purpose (Freire, 2003; Ranciere, 2019).

Nevertheless, the denial of a student or a teacher to exercise power at school or in a classroom, or an effort to maintain its original practice instead, is indicative of the process of making politics, a practice of emancipation in which political subjectivation takes place. Let's take, for instance, a general educational design, a national education policy, states set goals for their own institutional education, make universal designs, but thousands of social particularities that come to the same education process, an educational construct particularly designed therefore, also have their own educational goals about their own education. Here an antagonism arises between the design of political power on the student and the student's design on themselves.

This is because of the fact that particularities are a political subject per se and exhibit a unique political subjectivity and a *molecular resistance*, no matter to what extent they were subject to being shaped. Therefore, we can call the agency

of resistance that emerges in spaces and micro-political processes that structural politics cannot reach, *molecular resistance*. Therefore, it is necessary to consider the field of education as a field of hegemony struggle that features particular subjective movements and political subjective positions, including trade unions, their members, students and teachers. In this sense, the field of education cannot be considered a mere apparatus of political power, because the processes included in education do not operate as merely governed by the law of polis. The field of education has the potential of raising the law of demos against both the sphere of hegemony of the political power, and to the laws of polis, where the subjects of education turn into political subjects and resist the principles of political power. In this sense, education should be understood as a political field in which the struggle and liberation process work together.

Conclusion

In conclusion, the political should not be considered as delimited by state or political society in the context of education. On the contrary, education should be considered a *political field*, where it is possible to exhibit political subjectivity including ethical objections in all areas of education, in school and in the classroom, where a *molecular resistance* in which objections can be raised against all forms of biopower that may arise in educational relations, and where a broad hegemony struggle that includes not only structures but social particularities may take place.

Such a political approach would not consider the political as a process that concerns merely large "structures" such as the state or class power and other large "structures" opposed to it, but on the contrary, pervasive throughout society and in daily life, family and work areas and of course, as a process that can be seen even in the field of education at school. Accordingly, the field of education cannot be seen as a mere power device, because the processes involved in it do not operate as processes by which the police law of power is realized. The field of education is indicative of *liberation processes* in which the law of demos is put against both the hegemony of the power and the law of the police, the subjects of education turn into political subjects and resist the principles of power.

Recommendations

It should be democratically regulated in such a way as to give sufficient subjectivity to all actors in the educational processes. Researchs should be conducted on the actors involved in the educational processes to be political subjects in the political struggles to solve the problems related to education.

Acknowledgements

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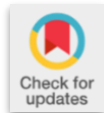
Research Article

The impact of authentic materials in the life sciences class on the learning of students at stage with moderate intellectual disability[1]

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Article Info	Abstract
            	The aim of this study is to reveal the effectiveness of using authentic materials for teaching daily weather conditions, which is among the learning outcomes of life science class, to special-needs students with moderate intellectual disability who receive education at Stage I in special education practice schools, in a teaching process involving the participation of their parents. In the present study, we used an action research design, which is one of the qualitative research approaches. The study sample consisted of three parents, and three students with moderate intellectual disability who received education at Erzurum Special Education Practice School in the Yakutiye district of Erzurum in the 2019/20 academic year. As a data collection tool, a rough evaluation form was used as a criterion-dependent assessment tool in the pre-application, post-application and general evaluation stages so as to determine the current status of special education students. On the other hand, parent and teacher interview forms were used to determine their views on the practice, video recording to evaluate the processes, and ABC recording (anecdotal recording) to detect the stimuli that appeared before and after the students' behaviour and to predict the function of such behaviour. Descriptive analysis technique was used for the analyses in accordance with the qualitative research approach. In the data obtained at the end of the first four weeks, the number of correct responses before the application was found to be very low, while almost all of the answers given after the application were correct. In the general evaluation phase, the correct responses obtained for all questions used during the activity in which various authentic materials were used indicated a positive contribution to students with moderate intellectual disability with respect to learning about daily weather conditions. It can therefore be recommended that authentic materials be used more in the learning processes of students with moderate intellectual disability.

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Introduction

Access to education and benefiting from public services are regarded as human rights. Education of individuals in need of special education is an inevitable necessity in almost every developed society. In this sense, states should attach

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importance to special education. A special-needs child has some deficits in their cognitive behaviour, communication skills, motor functions, and social-emotional characteristics (Sart, Barış, Sarıışık, & Düşkün, 2016; APA, 2018). Due to these inadequacies, such children cannot perform their daily life functions or benefit from general education environments as required. These children, who are affected by their intense differences in one or more developmental areas, should be treated with different approaches than general approaches in which special education services should be offered. Children who need such services are known as special-needs children (Beckley 2002; Metin 2012). The purpose of this specially planned training is: "To develop the basic life skills of individuals, to meet their learning needs, to ensure their adaptation to the society, and to prepare them for work and professional life" (Eripek, 1998). The purpose of the education given to children with special educational needs is to enable them to acquire skills that will help them to be self-sufficient in the future and get used to living as part of the society. Achieving this goal is possible by determining the educational needs of such individuals, taking into account what they can do with their individual differences, and providing them with educational environments suitable for their needs (Cavkaytar 2000; Hausken & Rathbun, 2002). One of the basic conditions of democratic societies is equality of opportunity in education, and one of the important ways to ensure this in education is to provide special education services for individuals with special needs. In this connection, in the Special Education Services Regulation, special education is defined as "with a similar point of view, employing specially trained personnel to meet the educational and social needs of individuals in need of special education, involving developed education programs and methods in the education system, conducting education in appropriate environments where characteristics of these individuals are considered in all development areas based on their competencies in academic disciplines" (MoNET, 2018).

Among the individuals with special needs, those with intellectual disability have an important place. Intellectual disability "poses significant limitations in current functions. This is a state of markedly subnormal mental functioning, as well as limitations in two or more of the adaptive skill areas associated with mental functioning (communication, self-care, home life, social skills, social usefulness, self-management, etc.)" (Luckasson & Reeve 1992; Eripek 1996). Individuals with intellectual disability are divided into three groups: (1) Mild Intellectual Disability: It is defined as "an individual who needs special education and support education services at a limited level due to his/her mild disability in mental functions and conceptual, social, and practical adaptation skills" (Heward 1999; Eripek, 2009; Çıkılı, 2013); (2) Moderate Intellectual Disability: Many children with moderate intellectual disability have significant delays in their development during the preschool years. As they get older, the differences between them and their peers become more evident in terms of different developmental characteristics. About 30% of these children have Down Syndrome, while about 50% of them have different types of brain injury (Sucuoğlu, 2010); (3) Severe and Very Severe Intellectual Disability: Children with severe and very severe intellectual disability are noticed at birth or immediately after birth. These children, who are usually born with damage in their nervous system, also have other deficits and health problems. Thanks to the technological developments in the field of education, it appears that individuals with severe/very severe intellectual disability can actually learn many skills that were once believed to be hard to be learned by them, and can now fulfil their social responsibilities (Eripek 2009; Friend 2013).

Based on the principle of equal opportunity in education, it is aimed to ensure equality and unity in education by providing students with appropriate materials and different teaching methods and techniques (Kırcaali-İftar, 1998). The ability of children in need of special education to meet their needs, to live independently, and to acquire and develop social life skills is directly related to the education they receive (Bender & Valletutti 1982; Fırat 2010). Using teaching materials facilitates perception and learning. It attracts attention, arouses interest and brings liveliness to the classroom. It shortens the length of learning process, reinforces knowledge, and helps to make learning permanent. In addition, it increases students' participation in the lesson and promotes their desire to read and research. It also enables objects, facts and events that cannot be brought or visited in the classroom environment to be transferred to the classroom environment (Apperson, Laws, & Scepansky, 2006; Çelik, 2007). Instructional materials generally consist of course presentation content made by using different tools in order to ensure that the course achieves its purpose. The importance of the use of such materials has begun to be emphasized more in curricula. Most of the lessons include

acquisitions and activities that require using teaching materials (Lowry 1999; Yanpar, 2007) The development of these materials within the scope of the life sciences class, which has an important place especially in acquiring life skills, will contribute to individuals with special needs in terms of acquiring many skills in daily life. The review of the content and definitions of the life sciences course shows that it undertakes the responsibility of "preparing children for life and raising awareness of life" by selecting and organizing the basic knowledge, skills, attitudes, views, and values required by our age in the field of natural and social sciences (Öztürk & Dilek, 2004).

Considering Piaget's stages of development, students who need special education are regarded to be in the preoperational and concrete operational stages with respect to cognitive skills. In this connection, as the levels of the classes increase, the extent of soft knowledge also increases. There is a need to enrich the materials used to provide these students with soft knowledge and to design authentic course materials. The use of materials is of great importance to ensure permanent learning in special-needs children. The scarcity of literature on the necessity of using materials in teaching such children increases the importance of the present study. Considering the cognitive status of students in need of special education, the educational acquisitions are quite limited. For this reason, when choosing the educational goals, it should be taken into account that these are life-oriented and targeting future learning outcomes (Piaget, 2015).

A review of the literature on special-needs students shows that research especially focuses on teaching science, mathematics, visual arts, music, and literacy, as well as on making such students develop self-care skills. These studies have employed a number of methods and techniques such as computer-assisted teaching, teaching with songs, direct instruction, constant time delay teaching methods and materials (Margalit, 1995; Dündar, 2006; H. Tanju, E., & Gönen, M. 2006; Register, D., Darrow, A., Swedberg, O., & Standley, D 2007; Duman, N., & Çiftçi Tekinarslan, 2007; Mechling, L. C., 2007; Fitzgerald, G., Koury, K., & Mitchem, K. 2008; Vayiç, 2008; Kot, M., Sönmez, S., & Yıkmış, A, 2017; Coşkun, İ., & Geç, H, 2018). No studies have been found on the use of authentic materials in teaching life sciences in special education, for the purpose of ensuring the acquisition of basic concepts and skills regarding daily weather conditions.

Problem of Study

In this respect, the main purpose of this study is to reveal the effectiveness of authentic materials for teaching about daily weather conditions in life science lesson to students with moderate intellectual disability who receive education at Stage I in special education practice schools, with the participation of the parents. In line with this main purpose, answers to the following questions were sought:

➢ What are the parents' views before the application with authentic materials and the results obtained by the teacher before and after the application with the criterion dependent assessment tool?

➢ What are the parents' views on the contribution of the use of authentic materials to generalization and the results obtained by the teacher with the criterion dependent assessment tool?

➢ What are the parents' views regarding the general evaluation made as a result of the use of authentic materials and the results obtained by the teacher with the criterion dependent measurement tool?

➢ What are the views of the teacher participating in the survey regarding the use and effectiveness of authentic materials?

Method

Research Design

This study has been designed as action research that includes qualitative data collection techniques. In this context, various teaching materials have been developed with a special focus on the necessity of using authentic materials, and applied for teaching daily weather conditions in the life sciences course. The reason for employing an action research design in this study was its suitability for the nature of the situation examined since a teaching activity was developed in order to contribute to the learning of students with moderate intellectual disability in the classroom where the application was made.

Action research has been defined in different ways, some of which can be listed as follows: Action research expresses a systematic approach that enables individuals to find effective solutions to the problems they face (Stringer, 2007). The

main purpose of action research is to examine and try to change the wrong situations and to develop new solutions. According to Mertler (2008), and Gay, Mills and Airasin (2012), action research allows teachers to reveal the real problems they experience in the classroom and to find solutions to those problems, thereby closing the gap between theory and practice. In this respect, action research refers to the process of conducting research in real schools and classroom environments to understand and improve the quality of activities or teaching practice (Johnson, 2014).

Data Analysis

In action research, data is composed of information, situations, or observations that are collected or recorded. Action research is not just about writing down what we believe to be true, but rather the task of collecting data and drawing conclusions based on that data (Johnson, 2014). In this direction, the analysis of the data obtained as a result of this study was carried out in accordance with the qualitative approach.

Simultaneous data analysis while collecting data enables the researcher to form the study and make it more in-depth (Glesne, 2013). The data obtained in this study were analysed both during the process and at the end of the application. The analysis of the data was, therefore, presented in two parts as the analyses made during the process and those made at the end of the process. In this context, descriptive analysis technique was used to analyse the data obtained during and at the end of the process.

Analyses During the Process

Analysing the data in the process evaluates whether the applied action plans solve the problem and guides the researcher about which data is to be reached in the next stage (Johnson, 2014). Thus, analysis comments shed light on the next phase of the action research cycle, which is the action plan development process. Necessary analyses were made during the situational determination and application phase of the research. The data analyses made during the situational determination phase and during the process could be listed as follows:

➢ Official documents (IEP's, rough evaluation forms, educational evaluation reports provided by the guidance research centre),

➢ Each student was evaluated according to the checklist developed at the end of the situational determination phase and the students' preliminary knowledge levels were determined regarding the unit of "Our Earth and Celestial Bodies" to be dealt with during the application phase.

➢ In this process, the data was regularly filed and backups of the data were taken.

➢ Target students were determined according to the data obtained.

All parent interviews, teacher pre-interviews and post-interviews, video recordings and ABC (Anecdotal) recordings made during the application were examined together with the application teacher. With the help of such data, student performances and existing problems were evaluated from the perspective of both the researcher and the teacher. In line with the anecdotal records, measures were taken in order to ensure the next activity to be more successful. In this connection, it was deemed necessary to ensure that students take a more active role in the course. In addition, the daily evaluation data of the students were examined so as to check whether there was any progress in students, and the general situation was evaluated.

Analysis Performed After Data Collection

Depending on the analyses made during the process, data were collected and analysed. In this direction, the data of the criterion-dependent assessment tool and the practice teacher interview form prepared for general evaluation were analysed. In line with the sub-objectives of the study, the data obtained with the criterion-dependent assessment tool applied by the teacher for general evaluation were analysed. In conformity with the nature of the qualitative research approach, descriptive analysis technique was used, and data were analysed according to predetermined themes. In line with another sub-objective of the study, an interview was held with the teacher who carried out the activity. As a result of the interview, the data were analysed in accordance with the predetermined themes in accordance with the reported descriptive analysis technique.

Ensuring the Validity and Reliability of the Data

In scientific research, two of the most important criteria that ensure the credibility of the results are the concepts of validity and reliability. These criteria need to be present in qualitative research as well as in quantitative research. However, the concepts of validity and reliability are handled in different ways in quantitative and qualitative research (Yıldırım & Şimşek , 2016).

Validity indicates how many of the situations are measured among those that are actually intended to be measured in scientific observations (Johnson, 2014). Guba (1981) emphasized that for the validity of action research, the trustworthiness of the research should be ensured. The author explained the provision of reliability in four stages: credibility, dependability, transferability and confirmability, which can all be explained as follows:

Credibility

Due to their participatory nature, action research includes some different criteria. Some researchers make various criticisms that action research has fewer features. In order to eliminate this criticism, it is necessary to ensure credibility in action research (Mertler, 2019). In order to ensure credibility in the present study, the researcher chose the special education practice school where he worked as the place of survey. All activities carried out during the application process of the study were recorded with videos, and interviews with the prepared forms. Nine different authentic materials were prepared, and activity plans were developed and implemented as regards the authentic teaching materials. The activity plan for each material was planned, implemented and evaluated in the application's systematic cycle. Therefore, the activity planning cycle of the study was repeated nine times during the implementation process.

Dependability

To ensure a strategy of dependability in action research, it is necessary to establish a group that controls the research data. This group should observe whether all the steps of the study are carried out in line with its objectives and make the necessary controls (Uzuner, 2005). In this study, opinions were received from three field experts from the field of dependability, as result of which, five evaluation meetings were held throughout the implementation process.

Transferability

Unlike quantitative studies, the results cannot be generalized in qualitative studies. However, the applicability of the results can be ensured in similar situations and conditions. Therefore, it is necessary to describe the study in detail and ensure its transferability (Stringer, 2007). In order to ensure transferability, the researcher collected in-depth data with different data collection tools by using the parent interview form, the evaluations of the teacher before and after the application, the teacher interview form at the end of the application, the video recordings and the criterion-dependent assessment tool. In addition, the researcher described the implementation processes of the study in detail with ABC (anecdotal) records and frequently included direct quotations for the interpretation of the data.

Confirmability

In order to ensure confirmability in action research, data collected must be unbiased (Uzuner, 2005). The data collected during the study were collected objectively without the interpretation of the researcher so as to ensure the researcher's confirmability. Using different data collection techniques, the researcher compared the scripts and made descriptive analyses on them. In addition, the researcher tried to be impartial during the presentation and interpretation of the findings and gave direct quotations from the data obtained during the study. In order to ensure objectivity in the analysis of the data, the opinions of the field experts were taken.

Results

This section presents the data obtained in accordance with the research questions. The results are shown under the headings indicating the findings related to the parents' opinions prior to the teaching activity with the authentic teaching materials and the teacher's opinions before and after the application in the first four weeks, the findings regarding the effect of the applications made with authentic materials on generalization in the fifth week, the findings related to the general evaluation of teaching with authentic materials in the sixth week, and the findings related to the teacher's opinions about the applications made with the authentic teaching materials in the final week.

Results Based on the Parents' Views Prior to the Teaching Activity Conducted with Authentic Teaching Materials and on the Teacher's Criterion-Dependent Assessment Tool Before and After the Activity

This part presents the answers to the questions asked by the parents to the students with moderate intellectual disability before the application and the assessments made by the practice teacher with the criterion-dependent assessment tool before and after the application. The teaching activities conducted in the first four weeks are given in tables and presented in detail.

Results of the Activities in the First Week

Parents' Views Before the Teaching Activities Conducted with Authentic Teaching Materials

In line with the research question, the answers to the questions asked by the parents to the students regarding the acquisition of "Rain as Part of Daily Weather Conditions" are given in Table 1.

Table 1. Results based on the questions asked by the parents to the students regarding the topic of "rain as part of daily weather conditions"

Statements	P1		P2		P3	
	Yes	No	Yes	No	Yes	No
Does your child look out of the window and respond to the question: "What is the weather like today"?		+		+		+
Does your child demand activities as appropriate to the weather conditions? (Going to the park, playing snowballs, etc.)		+		+		+
Does your child behave appropriately at home in accordance with daily weather conditions? (Like not opening windows in cold weather.)		+		+		+
Does your child notice the changes in daily weather conditions?		+		+		+
Does your child pay attention to the weather conditions when choosing clothes?		+		+		+

Table 1 shows that all parents expressed negative opinions regarding the statements. In this respect, it can be stated that the students do not have any knowledge about the given notifications.

Results Based on the Teacher's Criterion-Dependent Assessment Tool Used Before and After Teaching with Authentic Materials

In line with the research question, Table 2 presents the results based on the teacher's criterion-dependent assessment tool regarding the topic of "*Rain* as Part of Daily Weather Conditions" before and after the application.

Table 2. Results based on the criterion-dependent assessment tool regarding the topic of "rain as part of daily weather conditions" before and after the application

Statements	Pre-application			Post-application		
	S1	S2	S3	S1	S2	S3
The student shows the rainy weather as indicated in the "Felt book" material.	-	-	-	+	+	+
The student shows the rainy weather on the material "Look - see - learn".	+	-	-	+	+	+
The student shows the rainy weather on the material called the "Wheel of Fortune".	-	-	-	+	+	+
The student shows the rainy weather on the material called the "Cube".	-	-	+	+	+	+
Criterion	1/4	0/4	¼	4/4	4/4	4/4

As can be seen in Table 2, the students gave correct answers to only two of the four statements before the application, and they gave correct answers to all of the statements after the application performed through authentic teaching materials.

The general evaluation of the first week practices revealed that before the implementation of the activities, the students with moderate intellectual disability gave incorrect responses to all the questions asked by their parents. In addition, the assessments of the practice teacher with the criterion-dependent assessment tool before the implementation of the activities indicated that the students S1 and S3 gave correct answers to one question and gave incorrect responses to the rest of questions, while the other student (S2) gave wrong answers to all of the questions. After the implementation

of the activities, it was determined that the students gave correct answers to all of the questions as seen in the assessments made by the teacher with the criterion-dependent assessment tool.

Results of the Activities in the Second Week

Parents' Views Before the Teaching Activities Conducted with Authentic Teaching Materials

In line with the research question, the answers to the questions asked by the parents to the students regarding the topic of "*Sunny Weather* as Part of Daily Weather Conditions" prior to the application are given in Table 3.

Table 3. Results based on the questions asked by the parents to the students regarding the topic of "sunny weather as part of daily weather conditions"

Questions	P1		P2		P3	
	Yes	No	Yes	No	Yes	No
Does your child look out of the window and respond the question: "What is the weather like today"?	+		+		+	
Does your child demand activities as appropriate to the weather conditions? (Going to the park, playing snowballs, etc.)		+		+		+
Does your child behave appropriately at home in accordance with daily weather conditions? (Like not opening windows in cold weather.)	+		+		+	
Does your child notice the changes in daily weather conditions?		+	+		+	
Does your child pay attention to the weather conditions when choosing clothes?	+			+		+

As can be seen in Table 3, all of the parents gave positive responses to the following question: "Does your child look out of the window and answer the question "What is the weather like today?", indicating that they received correct responses from all three students (S1, S2, and S3).

In addition to that, it seems that all of the parents received wrong responses from their children (S1, S2, and S3), and thus, they expressed negative responses to the question: "Does your child demand activities as appropriate to the weather conditions? (i.e., Going to the park, playing snowballs, etc.)"

It is also apparent that all of the parents gave positive responses to the following question: "Does your child behave appropriately according to daily weather conditions at home? (Like not opening windows in cold weather)", indicating that they received correct answers from all three students (S1, S2, and S3).

Moreover, the above-mentioned table shows that only one student's (S1) parent mentioned to have observed a negative attitude regarding the following statement: "Does your child notice the changes in daily weather conditions?", while the other two students seemed to have presented positive attitudes (S2 and S3).

The table also shows that only one student's (S1) parent mentioned to have observed a positive attitude regarding the following statement: "Does your child pay attention to the weather conditions when choosing clothes?", while the other parents presented negative responses pertaining to their children's attitudes (S2 and S3).

The Results of the Teacher's Criterion-Dependent Assessment Tool for Before and After the Implementation with Authentic Materials

In line with the research question, the results obtained by the practice teacher based on the criterion-dependent assessment tool before and after the application as regards the topic of "*Sunny Weather,* as Part of Daily Weather Conditions", are presented in Table 4.

Table 4. Results based on the criterion-dependent assessment tool before and after the application as regards the topic of "sunny weather as part of daily weather conditions"

Statements	Pre-application			Post-application		
	S1	S2	S3	S1	S2	S3
The student shows the sunny weather as indicated in the "Felt book" material.	-	-	-	+	+	+
The student shows the sunny weather on the material "Look - see - learn".	-	-	-	+	+	+

The student shows the sunny weather on the material called the "Wheel of Fortune".	-	-	-	+	+	+
The student shows the sunny weather on the material called the "Cube".	-	-	-	-	+	+
Criterion	0/4	0/4	0/4	¾	4/4	4/4

As can be seen in Table 4, before the application, the students gave incorrect responses to all four statements, and after the application with the authentic teaching materials, one of them gave a wrong answer to one of the statements, yet all of the students responded correctly to all of the other statements.

The general evaluation of the second week practices indicated that the students with moderate intellectual disability gave correct responses to three of the questions asked by their parents before the implementation of the activities, yet they gave incorrect responses to two of them. Also, it is clearly seen that the students gave wrong answers to all the questions in the assessments made with the criterion-dependent assessment tool before the implementation of the activities. After the implementation of the activities, the assessments made by the teacher via the criterion-dependent assessment tool, one of the students (S1) was found to have given a wrong answer to one of the questions, but responded to the other questions correctly. The other two students (S2 and S3) turned out to have given correct answers to all the questions.

Results of the Activities in the Third Week
Parents' Views Before the Teaching Activities Conducted with Authentic Teaching Materials
Table 5 presents the answers to the questions asked by the parents regarding the topic of "Snowy Weather as Part of Daily Weather Conditions" before starting the application in line with the research question.

Table 5. The results obtained from the questions asked by the parents to the students about the topic of "snowy weather as part of daily weather conditions"

Questions	P1		P2		P3	
	Yes	No	Yes	No	Yes	No
Does your child look out of the window and respond to the question: "What is the weather like today"?	+		+		+	
Does your child demand activities as appropriate to the weather conditions? (Going to the park, playing snowballs, etc.)		+		+	+	
Does your child behave appropriately at home in accordance with daily weather conditions? (Like not opening windows in cold weather.)	+			+	+	
Does your child notice the changes in daily weather conditions?	+		+		+	
Does your child pay attention to the weather conditions when choosing clothes?	+		+			+

The results obtained before the application regarding the children's relevant responses show that all of the students (S1, S2, and S3) gave correct answers according to what their parents stated about the following notification: "Does your child look out of the window and respond to the question: "What is the weather like today"?"

As can be seen in the table given above, one of the students (S3) gave a correct response regarding the statement: "Does your child demand activities as appropriate to the weather conditions? (Going to the park, playing snowballs, etc.)", while the other two (S1, S2) gave incorrect responses.

It was also observed that two of the students (S1, S3) gave correct responses in relation to the statement: "Does your child behave appropriately at home in accordance with daily weather conditions? (Like not opening windows in cold weather)", while one (S2) gave an incorrect response.

It was determined that all of the students (S1, S2, and, S3) responded correctly in relation to the statement: "Does your child notice the changes in daily weather conditions?"

It was found that two of the students (S1, S2) gave correct responses in relation to the statement: "Does your child pay attention to the weather conditions when choosing clothes?", while one of them (S3) gave an incorrect response.

The Results of the Teacher's Criterion-Dependent Assessment Tool for Before and After the Implementation with Authentic Materials

In line with the research question, the results obtained by the practice teacher based on the criterion-dependent assessment tool before and after the application as regards the topic of "*Snowy Weather,* as Part of Daily Weather Conditions", are presented in Table 6.

Table 6. Results Obtained from the Pre- and Post-Application Criterion-Dependent Assessment Tool on the Topic of "Snowy Weather as Part of Daily Weather Conditions"

Statements	Pre-application			Post-application		
	S1	S2	S3	S1	S2	S3
The student shows the snowy weather as indicated in the "Felt book" material.	-	-	-	+	+	+
The student shows the snowy weather on the material "Look - see - learn".	+	-	-	+	-	+
The student shows the snowy weather on the material called the "Wheel of Fortune".	-	-	+	+	+	+
The student shows the snowy weather on the material called the "Cube".	-	-	-	-	+	+
Criterion	1/4	0/4	1/4	4/4	3/4	4/4

The review of the responses of the students to the statements posed pre-application and post-application conducted with the authentic materials showed that they gave correct responses to only two of the four statements before the application, and that they gave incorrect responses to two of the statements after the application with the authentic materials, but correctly to the rest of the statements.

The general evaluation of the third week practices indicated that S1 and S3 gave correct responses to four of the statements before the implementation of the activities, yet they gave incorrect responses to one of the statements, whereas S2 responded three of the statements correctly, but two of them incorrectly. Also, it is clearly seen in the assessments of the teacher via the criterion-dependent assessment tool before the implementation of the activities that S1 and S3 gave correct responses to one statement each, but all the other three statements incorrectly; however, S2 responded to all statements incorrectly. The assessments made by the teacher with the criterion-dependent assessment tool after the implementation of the activities indicated that S1 and S2 gave incorrect responses to one question each, but gave correct responses to the other questions, whereas S3 gave correct responses to all of the statements.

Results of the Activities in the Fourth Week

Parents' Views Before the Teaching Activities Conducted with Authentic Teaching Materials

Table 7 presents the answers to the questions asked by the parents regarding the topic of "Cloudy Weather as Part of Daily Weather Conditions" before starting the application in line with the research question.

Table 7. The results obtained from the questions asked by the parents to the students about the topic of "cloudy weather as part of daily weather conditions"

Questions	P1		P2		P3	
	Yes	No	Yes	No	Yes	No
Does your child look out of the window and respond to the question: "What is the weather like today"?	+		+		+	
Does your child demand activities as appropriate to the weather conditions? (Going to the park, playing snowballs, etc.)	+		+		+	
Does your child behave appropriately at home in accordance with daily weather conditions? (Like not opening windows in cold weather.)		+	+		+	
Does your child notice the changes in daily weather conditions?		+	+		+	
Does your child pay attention to the weather conditions when choosing clothes?	+		+		+	

The results obtained before the relevant application show that all of the students (S1, S2, and S3) gave correct responses according to what their parents stated regarding the following question: "Does your child look out of the window and respond to the question: 'What is the weather like today?'"

As can be seen in Table 7, all of the students (S1, S2 and S3) gave correct responses regarding the statement: "Does your child demand activities as appropriate to the weather conditions? (Going to the park, playing snowballs, etc.)".

It was also observed that two of the students (S2, S3) gave correct responses in relation to the statement: "Does your child behave appropriately at home in accordance with daily weather conditions? (Like not opening windows in cold weather)", while one (S1) gave an incorrect response.

It was determined that two of the students (S2 and S3) responded correctly in relation to the statement: "Does your child notice the changes in daily weather conditions?", whereas one of the students (S1) responded incorrectly.

It was found that all of the students (S1, S2, and S3) gave correct responses in relation to the statement: "Does your child pay attention to the weather conditions when choosing clothes?"

The Results of the Teacher's Criterion-Dependent Assessment Tool for Before and After the Implementation with Authentic Materials

In line with the research question, the results obtained by the practice teacher based on the criterion-dependent assessment tool before and after the application as regards the topic of "*Cloudy Weather,* as Part of Daily Weather Conditions", are presented in Table 8.

Table 8. Results obtained from the pre- and post-application criterion-dependent assessment tool on the topic of "cloudy weather as part of daily weather conditions"

Statements	Pre-application			Post-application		
	S1	S2	S3	S1	S2	S3
The student shows the cloudy weather as indicated in the "Felt book" material.	-	-	-	+	+	-
The student shows the cloudy weather on the material "Look - see - learn".	-	-	-	+	-	+
The student shows the cloudy weather on the material called the "Wheel of Fortune".	-	-	-	+	+	+
The student shows the cloudy weather on the material called the "Cube".	-	-	-	+	+	+
Criterion	0/4	0/4	0/4	4/4	3/4	¾

As can be seen in Table 8, the students gave incorrect responses to all four statements (S1, S2, and S3) before the application, but after the application with the authentic materials, they gave incorrect responses to two of the statements, but correctly to all of the other statements.

The general evaluation of the fourth week practices indicated that S1 gave correct responses to two of the statements posed by her parent before the implementation of the activities, yet gave incorrect responses to three of the statements, whereas S2 and S3 responded to all of the statements correctly. Also, it is clearly seen in the assessments of the teacher via the criterion-dependent assessment tool before the implementation of the activities that none of the students gave correct responses to the statements. The assessments made by the teacher with the criterion-dependent assessment tool after the implementation of the activities indicated that S2 gave an incorrect response to one question, but gave correct responses to the other questions, whereas S1 and S3 gave correct responses to all of the statements.

Results Concerning the Generalization of Activities Conducted with Authentic Materials

Results of the Activities in the Fifth Week

Relevant parent views and the results obtained from the criterion-dependent assessment tool used by the teacher were examined in order to be able to determine the extent of generalization as a result of the four-week activities carried out to reveal the effectiveness of working with authentic materials in teaching daily weather conditions contained in the life science lesson acquisitions of students with special needs at Stage I in special education practice schools.

Parents' Views on the Effect of Applications Conducted with Authentic Materials on Generalization

In this context, the responses of the students to the questions asked by the parents are presented in Table 9 in order to provide findings about whether or not the generalization can be achieved as regards teaching the topic of "daily weather conditions such as rainy weather, sunny weather, snowy weather, and cloudy weather".

Table 9. Results Obtained from the Students' Responses to the Questions Asked by the Parents, to Explore Whether or Not Generalization can be Achieved for Teaching Daily Weather Conditions including, "Rainy Weather, Sunny Weather, Snowy Weather, and Cloudy Weather".

Questions	P1		P2		P3	
	Yes	No	Yes	No	Yes	No
Does your child look out of the window and respond to the question: "What is the weather like today"?	+		+		+	
Does your child demand activities as appropriate to the weather conditions? (Going to the park, playing snowballs, etc.)	+		+		+	
Does your child behave appropriately at home in accordance with daily weather conditions? (Like not opening windows in cold weather.)	+		+		+	
Does your child notice the changes in daily weather conditions?	+		+		+	
Does your child pay attention to the weather conditions when choosing clothes?	+		+		+	

As can be seen in the table given above, the results obtained before the relevant application show that all of the students (S1, S2, and S3) gave correct responses according to what their parents stated regarding the following question: "Does your child look out of the window and respond to the question: 'What is the weather like today?'"

It is also clearly seen that all of the students (S1, S2, and S3) gave correct responses according to what their parents stated regarding the following question: "Does your child demand activities as appropriate to the weather conditions? (Going to the park, playing snowballs, etc.)"

It can also be observed that all of the students (S1, S2, and S3) gave correct responses in relation to the statement: "Does your child behave appropriately at home in accordance with daily weather conditions? (Like not opening windows in cold weather)".

In addition, all of the students (S1, S2, and S3) gave correct responses in relation to the statement: "Does your child notice the changes in daily weather conditions?"

Also, all of the students (S1, S2, and S3) gave correct responses in relation to the statement: "Does your child pay attention to the weather conditions when choosing clothes?"

The Results of the Criterion-Dependent Assessment Tool Regarding Generalization After the Implementation with Authentic Materials by the Teacher

In line with the research question, the results of the criterion-dependent assessment tool consisting of the following materials, namely the "Felt notebook, look-see-learn, wheel of fortune, and cubes" were presented in tables, based on the activities applied by the teacher for the purpose of generalizing the method of using authentic materials for teaching "rainy weather, sunny weather, snowy weather, cloudy weather" conditions.

Table 1. Results Obtained from the Criterion-Dependent Assessment Tool in Relation to the Teaching Material of "What is the Weather Like Today?" After the Activities Carried out by the Teacher Regarding the Generalization of Learning Rainy Weather, Sunny Weather, Snowy Weather, and Cloudy Weather Conditions

Statements	Post-application		
	S1	S2	S3
The student shows the rainy weather on the teaching material of "What is the weather like today?"	+	+	+
The student shows the sunny weather on the teaching material of "What is the weather like today?"	+	+	+
The student shows the snowy weather on the teaching material of "What is the weather like today?"	+	+	+
The student shows the cloudy weather on the teaching material of "What is the weather like today?"	+	+	+
Criterion	4/4	4/4	4/4

As shown in Table 10, after the application conducted through authentic teaching materials, the students turned out to give correct responses to all of the statements (S1, S2, and S3).

Table 2. Results Obtained from the Criterion-Dependent Assessment Tool in Relation to the Teaching Material of "Felt Book" After the Activities Carried out by the Teacher Regarding the Generalization of Learning Rainy Weather, Sunny Weather, Snowy Weather, and Cloudy Weather Conditions

Statements	Post-application		
	S1	S2	S3
The student shows the rainy weather on the "Felt Book".	+	+	+
The student shows the sunny weather on the "Felt Book".	+	+	+
The student shows the snowy weather on the "Felt Book".	+	+	+
The student shows the cloudy weather on the "Felt Book".	+	+	+
Criterion	4/4	4/4	4/4

As can be seen in Table 11, the students turned out to give correct responses to all of the statements (S1, S2, and S3) after the application conducted through authentic teaching materials.

Table 3. Results Obtained from the Criterion-Dependent Assessment Tool in Relation to the Teaching Material of "Look-See-Learn" After the Activities Carried out by the Teacher Regarding the Generalization of Learning Rainy Weather, Sunny Weather, Snowy Weather, and Cloudy Weather Conditions

Statements	Post-application		
	S1	S2	S3
The student shows the rainy weather on the material named "Look-See-Learn".	+	+	+
The student shows the sunny weather on the material named "Look-See-Learn".	+	+	+
The student shows the snowy weather on the material named "Look-See-Learn".	+	+	+
The student shows the cloudy weather on the material named "Look-See-Learn".	+	+	+
Criterion	4/4	4/4	4/4

As seen in Table 12, the students turned out to give correct responses to all of the statements (S1, S2, and S3) after the application conducted through authentic teaching materials.

Table 4. Results Obtained from the Criterion-Dependent Assessment Tool in Relation to the Teaching Material of "Wheel of Fortune" After the Activities Carried out by the Teacher Regarding the Generalization of Learning Rainy Weather, Sunny Weather, Snowy Weather, and Cloudy Weather Conditions

Statements	Post-application		
	S1	S2	S3
The student shows the rainy weather on the material named the "Wheel of Fortune".	+	+	+
The student shows the sunny weather on the material named the "Wheel of Fortune".	+	+	+
The student shows the snowy weather on the material named the "Wheel of Fortune".	+	+	+
The student shows the cloudy weather on the material named the "Wheel of Fortune".	+	+	+
Criterion	4/4	4/4	4/4

As shown in Table 13, the students turned out to give correct responses to all of the statements (S1, S2, and S3) after the application conducted through authentic teaching materials.

Table 14. Results Obtained from the Criterion-Dependent Assessment Tool in Relation to the Teaching Material of "Cubes" After the Activities Carried out by the Teacher Regarding the Generalization of Learning Rainy Weather, Sunny Weather, Snowy Weather, and Cloudy Weather Conditions

Statements	Post-application		
	S1	S2	S3
The student shows the rainy weather on the material named the "Cubes".	+	+	+
The student shows the sunny weather on the material named the "Cubes".	+	+	+
The student shows the snowy weather on the material named the "Cubes".	+	+	+
The student shows the cloudy weather on the material named the "Cubes".	+	+	+
Criterion	4/4	4/4	4/4

As shown in Table 14, the students turned out to give correct responses to all of the statements (S1, S2, and S3) after the application conducted through authentic teaching materials.

The general evaluation of the fifth week practices indicated that all three students with moderate intellectual disabilities gave correct responses to all of the statements posed by their parents before the implementation of the activities. After the implementation of the activities, it was found that all of the students gave correct responses to all questions in the assessments made by the teacher with the criterion-dependent assessment tool, indicating that the generalization was successful in the studies carried out.

Results Concerning the General Evaluation of Activities Conducted with Authentic Materials Results of the Activities in the Sixth Week

As a result of the activities carried out to reveal the effectiveness of working with authentic teaching materials in teaching daily weather conditions contained within the life science lesson acquisitions of students with special needs studying at Stage I in special education practice schools, the opinions of the parents and the results of the criterion-dependent assessment tool used by the teacher were included in order to make a general evaluation.

Parents' Views on the General Evaluation Regarding the Effect of Applications Conducted with Authentic Materials

Table 15 presents, in line with the research question, the students' responses to the questions asked by their parents for the purpose of a general evaluation of the "daily weather conditions such as rainy weather, sunny weather, snowy weather, and cloudy weather" are presented in.

Table 15. Results obtained from the students' responses to their parents in the context of a general evaluation of the rainy weather, sunny weather, snowy weather, and cloudy weather conditions

Statements	P1		P2		P3	
	Yes	No	Yes	No	Yes	No
Does your child look out of the window and respond to the question: "What is the weather like today"?	+		+		+	
Does your child demand activities as appropriate to the weather conditions? (Going to the park, playing snowballs, etc.)	+		+		+	
Does your child behave appropriately at home in accordance with daily weather conditions? (Like not opening windows in cold weather.)	+		+		+	
Does your child notice the changes in daily weather conditions?	+		+		+	
Does your child pay attention to the weather conditions when choosing clothes?	+		+		+	

As can be seen in the table given above, the results obtained before the relevant application show that all of the students (S1, S2, and S3) gave correct responses according to what their parents stated regarding the following question: Does your child look out of the window and respond to the question: "What is the weather like today"?

It is also clearly seen that all of the students (S1, S2, and S3) gave correct responses according to what their parents stated regarding the following question: "Does your child demand activities as appropriate to the weather conditions? (Going to the park, playing snowballs, etc.)"

It can also be observed that all of the students (S1, S2, and S3) gave correct responses in relation to the statement: "Does your child behave appropriately at home in accordance with daily weather conditions? (Like, not opening windows in cold weather)".

In addition, all of the students (S1, S2, and S3) gave correct responses in relation to the statement: "Does your child notice the changes in daily weather conditions?"

Also, all of the students (S1, S2, and S3) gave correct responses in relation to the statement: "Does your child pay attention to the weather conditions when choosing clothes?"

The Results of the Criterion-Dependent Assessment Tool Regarding the General Evaluation After the Implementation with Authentic Materials by the Teacher

In line with the research question, Table 16 shows the results of the criterion-dependent assessment tool obtained after the activities (materials including picture cards, a wheel, a stacking game, a play mat) were applied by the teacher in the context of a general evaluation of using them for teaching the "rainy weather, sunny weather, snowy weather, and cloudy weather" conditions. Within the scope of the general evaluation, the findings were obtained by using different materials from the materials used in the first five weeks.

Table 16. Results Obtained from the Criterion-Dependent Assessment Tool in Relation to the Teaching Material of "Picture Cards" After the Activities Carried out by the Teacher Regarding the General Evaluation of Learning Rainy Weather, Sunny Weather, Snowy Weather, and Cloudy Weather Conditions

Statements	Post-application		
	S1	S2	S3
The student shows the rainy weather on the "Picture Cards".	+	+	+
The student shows the sunny weather on the "Picture Cards".	+	+	+
The student shows the snowy weather on the "Picture Cards".	+	+	+
The student shows the cloudy weather on the "Picture Cards".	+	+	+
Criterion	4/4	4/4	4/4

As shown in Table 16, all of the students (S1, S2, and S3) gave correct responses to each of the statements after the application conducted through authentic teaching materials.

Table 17. Results Obtained from the Criterion-Dependent Assessment Tool in Relation to the Teaching Material of "Wheel" After the Activities Carried out by the Teacher Regarding the General Evaluation of Learning Rainy Weather, Sunny Weather, Snowy Weather, and Cloudy Weather Conditions

Statements	Post-application		
	S1	S2	S3
The student shows the rainy weather on the "Wheel".	+	+	+
The student shows the sunny weather on the "Wheel".	+	+	+
The student shows the snowy weather on the "Wheel".	+	+	+
The student shows the cloudy weather on the "Wheel".	+	+	+
Criterion	4/4	4/4	4/4

As can be seen in Table 17, all of the students (S1, S2, and S3) gave correct responses to each of the statements after the application conducted through authentic teaching materials.

Table 18. Results Obtained from the Criterion-Dependent Assessment Tool in Relation to the Teaching Material Named "Stacking Game" After the Activities Carried out by the Teacher Regarding the General Evaluation of Learning Rainy Weather, Sunny Weather, Snowy Weather, and Cloudy Weather Conditions

Statements	Post-application		
	S1	S2	S3
The student shows the rainy weather on the "Stacking Game".	+	+	+
The student shows the sunny weather on the "Stacking Game".	+	+	+
The student shows the snowy weather on the "Stacking Game".	+	+	+
The student shows the cloudy weather on the "Stacking Game".	+	+	+
Criterion	4/4	4/4	4/4

As it is given in Table 18, all of the students (S1, S2, and S3) gave correct responses to each of the statements after the application conducted through authentic teaching materials.

Table 19. Results Obtained from the Criterion-Dependent Assessment Tool in Relation to the Teaching Material Named "Play Mat" After the Activities Carried out by the Teacher Regarding the General Evaluation of Learning Rainy Weather, Sunny Weather, Snowy Weather, and Cloudy Weather Conditions

Statements	Post-application		
	S1	S2	S3
The student shows the rainy weather on the "Play Mat".	+	+	+
The student shows the sunny weather on the "Play Mat".	+	+	+
The student shows the snowy weather on the "Play Mat".	+	+	+
The student shows the cloudy weather on the "Play Mat".	+	+	+
Criterion	4/4	4/4	4/4

As shown in Table 19, all of the students (S1, S2, and S3) gave correct responses to each of the statements after the application conducted through authentic teaching materials.

The general evaluation of the sixth week practices indicated that all three students with moderate intellectual disabilities gave correct responses to all of the statements posed by their parents before the implementation of the activities. Following the implementation of the activities with the materials different from the previous sessions, it was determined that all of the students gave correct responses to all questions in the assessments made with the criterion-dependent assessment tool. Thus, it was concluded that the students successfully achieved the desired goals.

Results Obtained from the Teacher's Views on the Activities Conducted with Authentic Materials

The results obtained from the interviews held with the practice teacher in order to determine her relevant views about the activities conducted with authentic materials were gathered and analysed under five themes in conformity with the interview questions.

Teacher's Views on How the Presence of Someone Other than the Students in the Class Affects Teaching

The participation of the parents was ensured during the implementation of the activities and the teacher's views were taken so as to determine the impact of parent participation. The relevant teacher views are presented as follows: "There was a slight influence on the teaching in the first week. The students made eye contact with the guests in the class. We observed a slight shyness while they were answering the questions. In the following weeks, this was not the case. The general flow of the teaching was not negatively affected. I even observed a self-confidence development in the students." Based on the above-mentioned view, it was seen that the students were influenced by the presence of their parents in the first week and hesitated while expressing their opinions, but this problem disappeared in the following weeks.

Teacher's Views on Possessing the Prerequisite Skills for Learning Daily Weather Conditions: "Saying and Showing the Concepts of Sun, Rain, Snow, and Cloud"

The teacher's views were taken regarding whether the students had the skills of "saying and showing the concepts of sun, rain, snow, and cloud", which are the prerequisite skills for learning about daily weather conditions. The relevant teacher views are presented as follows: "They can say the concepts of 'sun, rain, snow, and cloud' in relation to daily weather conditions." The practice teacher was of the opinion that the students could talk about the daily weather conditions and the basic concepts related to them.

Teacher's Views on Whether the Changes in Rainy, Sunny, Snowy, and Cloudy Daily Weather Conditions Attract Students' Attention

The teacher's views were taken on whether the changes in weather conditions attracted the students' attention. The relevant teacher views are presented as follows: "Changes in daily weather conditions caught the attention of the students. For example, they say that the house is brighter in sunny weather. They have observed that the sun is warmer, while the sky is greyer in rainy weather. It has drawn their attention since the whole place got wet when it rained as if it had been washed with water." It can be seen that students become aware of the changes in daily weather conditions and can express this verbally. In addition, it was determined that they made mention of the characteristics of daily weather conditions as a result of their observations and said that "the sun is warmer, and the sky is greyer in rainy weather". It is remarkable that the students seemed to have associated daily weather conditions with events from daily life, on which the teacher commented as follows, "It has drawn their attention since the whole place got wet when it rained as if it had been washed with water."

Teacher's Views on the Contribution of Students' Learning about Daily Weather Conditions to their Daily Life Skills

The teacher's views were taken regarding the contribution of learning about daily weather conditions to the daily life skills of the students in the sample. The relevant teacher views are presented as follows: "They are aware that we are now in the 'winter season', and when they go out to play snowballs, they always put on their gloves, scarves, berets and coats. They say they do not want to go out if it is too cold. Their families also say that they choose appropriate clothes by considering the weather conditions while choosing clothes at home." The teacher's opinion indicated that the students

exhibited behaviours in conformity with daily weather conditions. In this regard, it is seen that they acted depending on the particular weather condition, and chose their clothes accordingly, a situation which was also mentioned by their families.

Teacher's Views on Whether the Students Demanded Activities As Appropriate to the Weather Conditions

The teacher's views were taken as to whether the actions requested by the students were in conformity with the weather conditions. The relevant teacher views are presented as follows: "They ask for weather-appropriate activities at school, such as going out to the garden and playing snowballs according to the weather conditions." Based on the practice teacher's view, it is seen that the students acted in line with the weather conditions and demanded for outdoor or indoor activities accordingly.

<div align="center">

Discussion and Conclusion

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The aim of this study is to reveal the effectiveness of working with authentic teaching materials in teaching about daily weather conditions, which are included in the achievements of life studies lesson, with the participation of parents of students with special needs who receive education at Stage I in special education practice schools. In this respect, the results were discussed in line with the relevant literature and the results were presented.

When the parents' views collected before the application conducted with authentic teaching materials in the first four weeks and the results reached by the teacher before and after the application with the criterion-dependent assessment tool are evaluated in general, the relevant outcome can be listed as follows:

Considering the parents' views before the application, it was determined that the students gave correct responses to a significant portion of the questions in the other weeks (two, three and four) except the first week. This can be explained by the fact that the students grasped the subject and the learning started, since the parents asked the same questions to the students before each application about the daily weather conditions. Students were required to demonstrate their observation skills while answering the questions. Observation is one of the important skills needed to ensure that learning can take place. It can be assumed that this activity method also improves the observation skills of the students.

The results obtained by the teacher before and after the application with the criterion-dependent assessment tool in the first four weeks indicated that the number of correct responses before the application was very low, whereas almost all of the responses given after the application were correct, revealing that the use of authentic materials was effective in learning daily weather conditions for students with moderate intellectual disabilities.

Today, one of the most important factors that are directly influencing the education processes is the rapidly advancing and developing technology (Yarar Kaptan & Beldağ, 2021). The need to develop and use materials to support curricula is increasing in order to make learning easier and to ensure permanence, as well as to improve the quality of education and training (Nalçacı & Ercoşkun, 2005). The use of methods, techniques, tools and materials in educational processes is among the most studied concepts in the literature. Similarly, it has been stated in the literature that the creation of multiple learning environments for the effectiveness of the learning-teaching processes with the use of tools and materials will appeal to both the eye and the ear, so that permanent learning will take place (Şimşek, 2002). Since the use of teaching materials involves more sense organs in the learning process, it helps to ensure permanent learning, increases the quality of education and efficiency. In addition, it will possible to create an effective learning environment by offering richer experiences to students in the course environment (Doğdu & Arslan, 1993).

As seen in the relevant literature, the use of authentic materials proves to have a significant impact on the learning capacity of students with moderate intellectual disabilities. In a study called "Investigation of the Impact of Materials Developed in the Scope of 'Social Life Module' for Mildly Mentally Retarded Students" by Kosif (2019), the researcher reported that the materials used for teaching some of the achievements in the social life module to the mildly mentally retarded students contributed positively to their academic success and motivation. On the other hand, Arpacık (2014) concluded that using interactive multimedia materials for teaching students with intellectual disabilities would make significant contributions to learning in his study titled "Development Process of Multimedia Materials for Students with Learning Disabilities and the Effect on the Teachers and Students". Çiftçi (2009) concluded that the computer aided

material developed for the purpose of the study had a positive impact on students' learning. Similarly, İlanbey (2018) reported that the computer-assisted instructional material she developed for students with intellectual disabilities had a significant impact on their learning capacity. Avcıoğlu (2012) stated that the use of materials developed by teachers is effective on students' cognitive and affective behaviours as well as improving their academic achievement. The literature review shows many other relevant academic studies in the field (Gürsel, 1993; Yıkmış, 1999; Diler, 2000; Atik Çatak, 2006; Avcıoğlu, 2012; Bülbül, 2014; Mutlu, 2016; Keser, 2017; Gündüz, 2019; Hersh, Meng-Fen & Georgette 2003; Boster, Meyer, Roberto & Inge 2011). It is seen that the results obtained in line with the applied activities covering the first four weeks largely overlap with the relevant literature. In this framework, it has been concluded that the use of authentic teaching materials makes a significant contribution to the learning processes of students with moderate intellectual disability.

To achieve generalization, a skill or behaviour learned under instructional conditions must be able to be exhibited in different environments or in case of need so that it gains functionality (Taubman, Leaf, & Kuyumjian, 2011; Collins, 2012; Alberto & Troutman, 2015). In the relevant literature, generalization is expressed as "performing a certain kind of behaviour in different circumstances such as the environment, materials, persons, and time when it is not taught after it is learned under certain conditions, or the display of a behaviour that is similar to the learned behaviour and has the same function in different situations" (Sulzer-Azaroff & Mayer 1991; Scheuermann &Webber 2002; Tekin-İftar 2012).

The general evaluation made as a result of the generalization practices in the fifth week shows that the students with moderate intellectual disability gave correct responses to all the questions asked by their parents before the implementation of the activities. After the implementation of the activities, all of the students were found to give correct responses to all questions in the assessments made by the teacher with the criterion-dependent assessment tool. According to these results, it was concluded that the relevant activities were successful, that the activities carried out in the first four weeks were permanent, and that learning was achieved according to the generalization results.

As a result of the activities conducted for the general evaluation, it was seen that the students with moderate intellectual disabilities responded to all of the questions correctly before the implementation of the activities. It was concluded that all of the students gave correct responses to all questions in the assessments made with the criterion-dependent assessment tool after the activities conducted with the materials used differently from the previous sessions. As a result of the activities conducted by parents and teachers, the success in the generalization phase was also seen in the general evaluation phase, in which it was concluded that the use of materials different from the authentic materials used thus far and receiving correct responses to all questions made a positive contribution to students with moderate intellectual disability with respect to learning about daily weather conditions.

The relevant literature review also shows that the use of materials with different characteristics in the learning processes of students with special needs has positive effects on the generalization of learning and general evaluation. In this context, İlanbey (2018) investigated the effectiveness of the computer-assisted instructional material developed in order to teach the concepts of "many" and "a few" to students with intellectual disabilities in the study titled "The Effectiveness of Computer Assisted Instructional Material for Teaching 'Many Objects versus 'A Few Objects' Concepts to Students with Intellectual Disabilities". The study reported that the computer-assisted instructional material developed for the learning of students with intellectual disabilities affected learning and ensured the permanence of the behaviours. Dağseven (2001) stated that with the use of materials developed for students with intellectual disabilities in teaching processes, generalizability, which is one of the basic indicators of learning, is achieved as well as ensuring the acquisition of some mathematical skills. As a result of the study named "The Investigation of the Effect of the Teaching Material Designed for the Dressing Skill as Part of Gaining Self-care Skills", Arslan (2018) determined that the group to which the designed teaching material was applied progressed faster in acquiring the dressing skill. In like manner, in the relevant literature, there are many other studies conducted in different disciplines regarding the contribution of material use to permanent learning in the learning processes of students with intellectual disabilities and learning difficulties (Karahüseyinoğlu, 2002; Erben, 2005; Gınalı Göriş, 2006; Atik Çatak, 2006; Arslan, 2018).

As a result of the generalization and general evaluation practices carried out in the fifth and sixth weeks, it was concluded that the use of authentic materials in the learning processes of students with moderate intellectual disability contributed to achieving permanent learning.

The results obtained from the interview with the teacher about the activities made with authentic materials revealed that the students were influenced and they felt hesitant from the parents' presence in the first week, while this problem disappeared in the following weeks as expressed by the teacher. This is likely to contribute to the more unbiased answers given by the students and to further strengthen the results of the study. Parents' participation appears to enable them to spend time with their children, contribute to the discovery and development of children's interests and talents, a situation which positively affects children's success and increases the quality of education (Akkaya, 2007). In addition, Yücetaş Artan (2019) reviewed 144 studies consisting of articles, master's and doctoral theses written between 2000 and 2018 on parent participation in education and concluded that if the school and family cooperated, students would feel more secure at school and would be more successful in the academic field. In the study conducted by Azap (2011), which evaluated special education practice schools in terms of purpose, structure, and process within the framework of parents' opinions, the learning process stood out as the most positive evaluation of parents, a situation which coincides with the result of the present study. The relevant literature review demonstrates similar results being repeated in many other studies (Keçeli-Kaysılı, 2009; Ayral et al., 2012; Dinç 2017; Ertem & Gökalp 2020). Yücetaş Artan (2019) reported that "Education that starts in the family continues at school and the family is always the complement of the school", thereby supporting the results of this study. In this regard, it was concluded in the sub-problems of the study that the activities carried out by parents at home and parents' participation in the classroom contributed positively to the learning of students with moderate intellectual disability.

This study found out that expressing the basic concepts about daily weather conditions, noticing the changes in daily weather conditions and making observations about them contributed positively to the learning of such phenomena by students with moderate intellectual disability.

Based on the activities contained in this study, it was concluded that the students behaved according to the daily weather conditions and acted according to a particular weather condition, they made their clothing preferences accordingly, a situation which was also indicated by their families. In addition, the students appeared to act according to the weather conditions while expressing the actions they demanded and were seen doing their actions accordingly. It was found that students preferred clothes according to daily weather conditions and expressed their wishes according to weather observations. In this direction, the transformation of students' learning into behaviour can be explained by the complete achievement of learning.

According to the teachers' views, it is seen that learning has been achieved to a great extent as a result of the practices carried out by using authentic teaching materials. Avcıoğlu (2012) reported that the use of various equipment in the lessons would positively affect the success and development of the students at school, that such students were interested in the use of different tools and equipment, and that the use of tools and equipment led to a significant increase in the interest of students with intellectual disabilities towards lessons and the school. In addition, teachers are often of the opinion that the use of tools and materials in the lessons supports education in terms of visual aids, embodies the subjects, allows learning by doing, draws the attention of the students, arouses interest and attention in the lessons and ensures their active participation, makes the children less bored and prevents the formation of problem behaviours accordingly, makes learning easier and enjoyable, increases students' success, makes learning more permanent and long-lasting, and alleviates the burden of teachers. Research shows that the use of materials with different characteristics has a positive effect on the learning of students with special needs (Keser & Özdemir, 2017; Mete & Yıldırım, 2018; Özlem Yazlık, 2018; Çay, Yıkmış & Sola Özgüç, 2020; Yıldız & Yıkmış, 2020).

The results obtained from the teachers' views in relation to the use of authentic materials for teaching daily weather conditions contained within the life science class acquisitions of the students with moderate intellectual disability at Stage I in special education practice schools reveal that the students were able to express the basic concepts about daily

weather conditions and notice the changes in the weather conditions. It appeared that they behaved according to daily weather conditions, a situation which can be explained by the effectiveness of the materials used in this study.

<h2 align="center">Recommendations</h2>

This Section presents the following recommendations for practitioners and researchers in line with the results of the study:

➢ Considering the effect of authentic materials on the learning processes of students with moderate intellectual disability, such materials should be included more in the teaching practices.

➢ In order to ensure learning and generalization, it can be recommended to ensure the participation of parents in the education processes of students with moderate intellectual disability.

➢ In order to monitor, control and evaluate the learning processes of students with moderate intellectual disability in a systematic way, it can be suggested that special education teachers prepare and use a criterion-dependent assessment tool specific to each learning acquisition.

➢ In order to achieve learning, generalization, and permanence, it can be recommended to use different types of authentic materials, taking into account the characteristics as regards the students' disability. In order for learning, generalization and permanence to take place, it is recommended to use realistic materials that show different types of weather events, traffic rules and help them gain daily life skills, taking into account the disability characteristics of the students.

➢ It can be recommended that authentic materials be designed in accordance with daily life in order to transform the learning processes of students with moderate intellectual disability into permanent behaviour.

➢ It can be suggested that the teaching materials developed for use in the learning processes of students with moderate intellectual disability should be modular so that they can be used in different acquisitions.

➢ In this study, the students with moderate intellectual disability appeared to be very interested in the features such as inserting and removing in stacking games. It can be recommended that these features be included in the materials developed in this context.

➢ The relevant literature shows that there are not enough studies on teaching geographical concepts in particular for students with moderate intellectual disability, and on social sciences, life studies and social studies in general. In this respect, it can be recommended to increase the number of practical academic studies.

<h2 align="center">Acknowledgement</h2>

<h2 align="center">Statements of Publication Ethics</h2>

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Appendix 1. Interview Form

Meeting date and time:

Interviewer name and surname:

My dear teacher; I need your opinions for my study titled "The impact of authentic materials in the life sciences class on the learning of students at stage i with moderate intellectual disability" We hope that the results of this study will contribute to the field of special education.

Everything you tell us during the interview process is confidential. It is not possible for anyone other than the researchers to see this information.

It is up to you whether to attend the meeting or not.

Before we start, do you have a thought or a question you would like to ask about what I have said?

I would like to record the conversation in writing, if you allow me. Is this a problem for you? If you'll excuse me, I'd like to start the questions.

Questions

Q1. How did the presence of a foreigner other than the students in the classroom during the teaching affect the teaching? Please explain.

Q2. What was the contribution of the student's learning about daily weather events to their daily life skills?

Q3. Are the actions requested by the student appropriate to the weather? (Going out to the garden, playing snowballs, etc.)

Q4. Did he/she have the skills of "Saying and showing the concepts of sun, rain, snow, cloud", which are the prerequisite skills of daily weather events?

Q5. Did the changes in rainy, sunny, snowy, cloudy daily weather events catch the student's attention?

Appendix 2. Material Introduction

How is the weather today? (Rainy weather)

How is the weather today? (Sunny weather)

How is the weather today? (Snowy weather)

How is the weather today? (Cloudy weather)

Felt Notebook (Rainy)

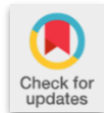Felt Notebook (Sunny)

Felt Notebook (Snowy)

Felt Notebook (Cloudy)

Look-See-Learn

Plug in

Young Wise
Publishing

Research Article

Managing curriculum policy implementation at correctional centres in selected South African Regions

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Article Info	Abstract
	In terms of section 29 (1) (a) of the Constitution of the Republic of South Africa Act, Act 108 of 1996, everyone has the right to a basic education, including adult basic education. Notably, education is a basic human right even for those in conflict with the law (offenders). This study is geared towards investigating management of curriculum policy implementation at Correctional Centres in North West (NW) and Gauteng (GP) regions in South Africa as Department of Correctional Services (DCS) geographical demarcations. It is therefore imperative for education managers in Correctional Centres to manage education curriculum effectively and efficiently in order to avert criminal behaviour and relieve socio-economic hardships that citizens might experience. The theoretical framework of this study, instructional leadership model would be engaged in order to foster the change required. Schools are more effective and efficient teaching and learning environment through instructional leadership (IS) as a critical aspect of school leadership. Instructional leaders should ensure that every student receives the highest quality instruction in line with the managing of curriculum policy implementation. The study seeks to outline the challenges faced by research participants towards management of curriculum policy implementation in Correctional Centres schools (CCS) and to identify possible solutions to those challenges. The anticipated possible outcome would be a development of a model towards the proper management of curriculum policy implementation strategy in correctional centres. For the purpose of conducting empirical research, the qualitative methodology will be used. Both educators and SMT's should possess learning area matter knowledge, pedagogical knowledge and content knowledge. The DCS and DoE should train members of SMT's on how to monitor, evaluate and support educators in terms of new teaching methodologies. . DCS and DoE must have a common understanding of how they would enhance training to successfully manage curriculum policy implementation process.

To cite this article:

Introduction

Educators in DCS are appointed in terms of Correctional Services Act, 111 of 1998 (CSA), Section 41 Regulations (2(c)) and Chapter 3: part 1.3 as qualified academic or technical and must offer educational services to offenders. Educational programmes offered to offenders, should be in line with South African Qualifications Authority (SAQA) and the National Qualifications Framework (NQF) as outlined in the CSA, 111 of 1998. It is therefore imperative for education managers in CCS to avert criminal behaviour by managing the curriculum effectively and efficiently in order to relieve socioeconomic hardships that offenders might have experienced.

According to White Paper on Corrections, 2005, Section (8)(2)(1) the right to education is not curtailed by

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incarceration as literacy, schooling and basic adult education are priorities in DCS and School Management Team (SMT), Head of Department (HOD), Deputy Principal (DP), and the Principal (P) guided and supported Department of Education (DoE). Additionally Department of Education 27, Section 4(c) – (d) (1996) stipulates the right to equitable education opportunities, redress of past inequality and that no person must be denied educational opportunity to the maximum of his/her ability.

The members of the SMTs are instructional leaders and they are responsible for taking the lead in putting their school curriculum into practice and improving it (SMT 2000:1). The White Paper on Corrections, Section (9)(9)(2) outlined that education in the correctional environment must be in line with the education system of the general society. Rehabilitation can be achieved through combating illiteracy in CCS by providing educational programmes to offenders and increase training facilities for developmental programs

Education is a basic human right even for the offenders. In terms of the Constitution of South Africa, Section 29 (1) (a), everyone has the right to a basic education, including adult basic education. This is also recognised in Chapter 3: part (1) (2) (1) of the CSA, 111 of 1998 (CSA) which emphasises that offenders have the right to quality and effective education. There is need to promote a collective social responsibility for the rehabilitation and re-integration of offenders into the society, as productive and law abiding citizens. Therefore, the management and implementation of curriculum must be in accordance with the general policies of the Department of Education (DoE).

This study seek to explore the challenges management experiences of curriculum policy in Correctional Centres in two Regions (NW and GP. The primary responsibility of planning, managing and overseeing the curriculum policy implementation process is assigned to the SMT's. The responsibility of the SMT's is primarily that of overseeing the effective implementation of the curricula implementation process and must take into consideration the school human and physical resources, quality of teacher (ing) and learner (ing) (Madani, 2019 and Rogan & Grayson, 2003).

Moreover, DCS school managers must create and provide a conducive learning environment within the parameters of the available resources in which offender learners could grow individually and be equipped with requisite skills that could be used when reintegrated in the society. A distinction should be made between acquiring academic skills and further awarding of certificates, achieving qualifications and securing employment compared to soft skill that is change in emotions and attitudes and/or combination of the two (Bennett et al, 2008).

The school principal as an internal change agent is expected to initiate, facilitate and implement change by determining the procedures and methods for implementing change (Van Deventer & Kruger, 2005:44). The curriculum as a self-actualisation process should be removed from traditional curriculum practices hence students must be involved in studying how obstacles can be overcomed so that a more safe, secure and moral orientated society can be developed.

Aim of the Study

The aim of the research is to investigate challenges management and educator's experiences in managing the implementation of the curriculum policies in correctional centres schools. The objectives for this study are to:

➢ Explore the status quo of education management of the curriculum policy implementation in selected correctional centres schools.

➢ Investigate instructional leadership roles that educational managers play in education curriculum implementation.

➢ Investigate the educationists" skills and knowledge of managing the curriculum implementation in selected correctional centres schools.

➢ Determine the perceptions of the educationists in managing the implementation of the curriculum.

➢ Suggest a training program that should be provided to the educationists.

Research Problem

The research problem addressed in this study is whether ineffective curriculum policy implementation reflects failure of leadership in school setting. Flowing from the above, the central and guiding question is:

➢ What are the management challenges experienced by the educationist in managing education curriculum policy implementation in the Correctional Centres?

The guiding research sub-questions are:

➢ What is the status quo of the management of education curriculum policy implementation in selected Correctional Centres schools?

➢ What instructional leadership roles do educational managers play in the curriculum implementation?

➢ Do educationists in Correctional Centres schools have sufficient skills and knowledge in managing education curriculum implementation?

➢ What are the perceptions of the educationists in managing the curriculum implementation?

➢ What training should be provided to the educationists in the management of education curriculum implementation?

Method

Research Model

A qualitative approach was employed since the main aim of this study is to describe the principal as an instructional leader and the management of the curriculum policy implementation in the improvement of quality education through desirable outcomes.

Qualitative research is a naturalistic inquiry involving the use of non-interfering data collection strategies to discover the natural flow of events and processes and how participants interpret them (McMillan & Schumacher, 1993:372). A naturalistic enquiry means that data is obtained from a natural setting as possible and also deductively where evidence is drawn and logical conclusions are made (Newby, 2010:117). The natural setting is Correctional Centres in this study, as the direct source of data whilst the researcher remained the key instrument. The researcher considered the setting and people holistically, viewed as a whole and were not reduced to variables.

According to Jian (2022) and Mamabolo (2002:236), qualitative research is rooted in a phenomenological paradigm which holds that reality is socially constructed through individual or collective definitions. The role of the researcher is to facilitate a shared understanding amongst participants regarding the research objectives and possible outcomes.

A purposeful (non-probability) sampling technique was used in this study because data elements were situated near to where research data was gathered. The study took place in selected Correctional centres in security restricted areas or setting, therefore purposive or theoretical sampling offered the researcher some degree of control. Non- probability sampling technique was used and decisions concerning the participants were included in the sample taken by the researcher. Based upon variety of which may include specialist knowledge of the research issue or the capacity and the willingness to participate in the research.

The logic of the sample size is related to the purpose, the research problem, the major data collection strategy and the availability of information-rich cases (McMillian & Schumacher, 2010:328). In Correctional Centres educators are of a limited number, therefore all educators in North West, Limpopo and Gauteng Regions were considered for purposeful sampling.

Data Collection Tool: Interviews

An interview is a purposeful way to gain insight into educational issues through understanding the experience of those individuals whose lives constitute education. As a technique of inquiry, an interview is most consistent with people's ability to make meaning through language. The researcher considered a list of key themes, issues, and questions to be covered. In semi- structured interviews, the order of the questions

could be changed depending on the direction of the interview and interview guide was used (see Annexure A).

Qualitative data were processed and analysed according to different themes. The interview data presented in themes were identified through the interview transcripts. Respondents and schools were distinguished from each other by means of the following key:

Table 1. Keys used forrespondents and selected schools

Respondents		Schools	
Word	Key used	Word	Key used
Principal	P	School 1	S1
Deputy Principal	DP	School 2	S2
Head of Department	HOD	School 3	S3
		School 4	S4
		School 5	S5

Data Analysis

The following are themes that emerged from the data obtained from the interviews.

Results and Discussion

Theme 1. Status Quo of Curriculum Policy

NCS and CAPS are mostly implemented in youth centres or centres of excellence where offenders are juveniles and they operate as full-time schools. P1 from S1 "*.... curriculum and all national protocols are policies governing the curriculum and are implemented and adhered to*" thus P3 from S5 further confirmed that "*we are offering CAPS curriculum*". HOD 1 from S2

"*....as that says curriculum CAPS is implemented*" and further said that

"*...AET everything runs smooth as we are getting everything from the DoE, regularly invited to workshops*". DP1 S3 "is just needed more is training to be effective "*In our school actually we are focusing on AET and FET*" and P2 from S4 "*we do offer AET and FET*". Interviews with different SMT members confirmed that different curriculum policies are implemented (NCS, CAPS, FET and AET) in selected correctional services schools. P3 from S5 further confirms that "*...are attending classes, there are teachers allocated to teach different subjects*".

Educational mangers further alluded to the fact that they experience challenges in the successful management of curriculum implementation process.

P1 from S1 "*we are still having few or small challenges or redefining some parts of speciality of the Correctional centre or facility as it is rare occasion or unique situation as related to schools outside. There are few things to be attended particularly with assignments and case studies, they got restricted because of their social restrictions*".

HOD 1 from S2 "*the status is not up to standard because we only attended only one session of CAPS... schools outside the CAPS training is done on regular basis... implementation of this curriculum is not up to standard... We are progressing very slowly hoping that the department will come and assist us in this implementation that it takes place correctly. We have so many challenges when it comes to SBA* (school-based assessment). *We don't even know exactly what is supposed to be registered as progress or on how you monitor progress. So those are the things that we need the DOE to come and assist us with so that we can implement the curriculum correctly so*".

P2 from S4 "*...there is a great shortage of human resource to manage the curriculum as per prescripts of the DoE*" and to alleviate the challenge P3 from S5 resorted to "*...help of fellow inmates who are assisting in teaching*". DP1 from S3 "*FET we got a challenge because we don't usually do what is expected from us especially time factor... "training schedule sometimes is not escalated to educators... usually make appointment with learning facilitators to catch-up of which is not always successful*".

Theme 2. Instructional Roles Of Education Managers

P1 from S1 "*lead but not managing in ensuring the policies of different subjects or administrative policies and classroom*

policies are being adhered to... as we are part of the classroom activities... to ensure that maximum output... will be the results... better performance of the learners and our marks/pass rate going to be improved".

Zheng, (2019) and Blasé and Blase, (2000) expressed instructional leadership in specific behaviours such as making suggestions, giving feedback, modelling effective instruction, soliciting opinions, supporting collaboration, providing professional development opportunities, and giving praise for effective teaching. It shows that the educational manager is taking a leading role and responsibility of the school activities in ensuring that school aims and objectives are met thus improved learner performance.

HOD 1 from S2 *"we monitor the standards they tally with what is expected... check whether they are up to record... classes if they have challenges that we can assist with and we also give support where necessary".* P3 from S5

"...my responsibilities are to ensure that CAPS curriculum is implemented and successfully so... I do is to monitor the progress and organise training for the offenders... Offenders are a tutor... interviewed checking obviously their qualifications and that's how I place them (offender tutors) and teachers that I am working with".

There is management, monitoring and evaluation of curriculum implementation to further establish if the set school's aims and objectives by educators are met and the necessary support where needed.

DP 1 from S3 *"...involves educators... meetings where we will discuss issues for implementation... Principal is playing the leading role... some of the new information is through educators... assigned to certain responsibilities".* P2 from S4 is of a different view *"...programs are taking place as required by the department is that curriculum requirements are cascaded down to the relevant or individual educators".*

S3 management towards curriculum implementation is a joint and concerted effort with educators as they are the main implementers and managers of curriculum at classroom level. There is interaction and improved communication within the school towards instructional activities. Whereas S4 communication and other school activities including management of curriculum implementation is from top to bottom thus not giving educators the feeling of being the role player at a particular level.

Theme 3. Skills and Knowledge of Educators

P1 from S1 *"...teachers/educators we are having are professionally qualified recruited"* The general feeling of SMT on knowledge and skills needed to implement curriculum was that, it is important that one is knowledgeable and has expertise in his/her job in order to perform the work efficiently and effectively. P1 from S1 and P2 from S4 agreed and had the same view respectively by saying *".... last year June 2013 not all attended but we were convinced that most of them have relevant information, knowledge and skills needed" "Yes educators are highly qualified and they all have the sufficient skills to implement the curriculum"* ... P3 of S5 is of the view that *"...does have skills but what I have noticed with this curriculum there are lot of challenges".*

HOD 1 from S2 differed with the above school whereby "[they] *don't have the necessary sufficient skills and knowledge in implementing the curriculum"* and further alluded to the aspect that educators *"regard the issue of training as critical as they do not have much training".* DP 1 from S3 agreed with HOD 1 from S2 by saying that educators *"just needed more training to be effective".* It emerged in the interview with SMT members that they use experience and expertise of some of their members including educators to implement some of the curriculum activities even if the experience some challenges.

Theme 4. Perceptions of Educators

P1 from S1 commended that:

"...we did have interaction with educators with outlined expectations... directed by policies but before the policy is implemented... we have a common understanding with them as our starting point... we are flowing to the same direction as we have agreed that we are going have one target". Whereby P3 from S5 *"...do adapt positively to the changes and they are ready especially when it is in line with education because they do understand the changes in curriculum and curriculum changes. We do work as a team to ensure that we adhere to the expectations of GDE and comply with the requirements they set for us".*

The environment and climate at S1 and S2 outline continuous improved communication amongst all staff

members thus improved perception and determination towards managing curriculum policy implementation. S5 strengthen their optimal management of curriculum policy implementation by involving the custodians of curriculum through their supportive provincial and regional structures.

Of which the school climate towards S2 and S3 is different whereby HOD 1 from S2 is of the view that "...*very frustrated imagine if one does have to perform beyond expectation while is not fully equipped... they go all out to go and consult other schools to get information for themselves... a good perception as they want this happening but then we also need to assist*". P2 for S3 further remarked that educators "...*need clear picture*" to effectively and efficiently manage curriculum policy implementation. DP1 from S4 commented by saying that "...*curriculum changes happen now and then*" of which this might imply that educators are not sure on how to effectively manage curriculum policy implementation thus negatively affecting instructional program.

Theme 5. Training and Support

The form of training and support that is provided to educationists in the managing of education curriculum implementation is totally dependent of the Department of Education from all the provinces of which it poses a big question on Department of Correctional services on their contribution towards educator's development and ultimate production.

P1 from S1 "...*one on one training by introducing subject committees... DoE subject seminar is called to a workshop... communicated down and up from educators to SMT and vice versa to ensure common understanding of the implementation of the school curriculum implementation*".

HOD1 from S2 "...*consulting other schools for assistance... consult the department to come and train...we can give them support and encourage them but they need to be trained*".

DP1 from S3 "...*training schedule sometimes is not escalated to educators we usually make appointment with learning facilitators to catch-up*".

P2 from S4 "...*usually get support from Gauteng Department of Education whereby we have a series of workshops and road shows whereby teachers are work shopped about curriculum implementation*". P3 from S5 "...*every year we do meet (GDE subject specialists) and then they outline everything that is what is expected per subject... Subject advisors per subject then from there we comeback with the necessary documentation then we give training to our offenders to what is expected. There are some subject advisors who visit our school. I organise a meeting between educator and subject advisor on subject related to give that support and the things they have to follow*".

Conclusion

Status quo of the management of curriculum policy implementation; The interviews with different SMT members confirmed that the different curriculum policies are implemented NCS, CAPS, FET and AET in selected Correctional Services Schools. NCS and CAPS are mostly implemented in youth centres or centres of excellence where offenders other school activities including management of curriculum implementation is from top to bottom thus not giving educators the feeling of being the role player at a particular level.

Instructional leadership roles of education managers towards managing curriculum implementation; It shows that the Section Heads/Principals are tasked with a leading role and responsibility of school activities. Therefore, they should ensure that school aims and objectives are met for improved learner performance. Educational mangers/principals further eluded the fact that they experience challenges in successfully managing the curriculum implementation process.

Interview data analysed show that the Section Head/Principal's   role is to drive the mission and vision of the school. The vision of the school is to inculcate the spirit and love of teaching and learning and this places the curriculum policy implementation at the core of everything the principal does.

Educationists have sufficient skills and knowledge of managing the curriculum implementation; Most of M+4 educators are encouraged by salary structure, promotion requirements, encouragement by DCS through bursaries and development of their teaching and management skills. Upward mobility through promotions is needed as most

educators are still at entry level (COII). Most of the educators are curriculum managers without positions. In spite of this issue, educators lead using the knowledge acquired through their service and interactions.

Most of the educators are in the AET stream and this is in line with DCS mandate to eradicate illiteracy. FET educators (39.1%) of which most of the learners after AET level 4 they opt for skills or vocational training in order to equip themselves for the outside world as sampled population to manage curriculum policy implementation of both NQF bands.

Perceptions of educationists on managing the curriculum implementation Educators believe that the Section Head/Principal's role is to continually strengthen the capacity of the SMT by being proactive and consultative in order to drive the vision of the school. Curriculum changes happen occasionally and this might impact negatively on educator's ability to effectively manage curriculum policy implementation. Instructional program could be negatively affected too.

Training and support provided to educationists in managing curriculum implementation; A higher number of educators had never attended workshops or training over three years and this is alarming. The DCS should make sure that more workshops are arranged to enhance proper management of curriculum policy implementation. These results also corroborate interviews findings where educators revealed that they depend entirely on the DoE for workshops and training on management of curriculum policy implementation.

The form of training and support that is provided to educationists in managing the curriculum implementation is totally dependent on the DoE in all provinces. It is therefore inevitable to wonder about what the DCS" contribution towards educator's development and ultimate production. Funding towards educator development must be sourced and increased to optimally and successfully manage curriculum policy implementation in schools as well as infrastructure.

Recommendations

Provision of quality education is thus a response to societal needs and expectation, advances in technology and globalisation. Teaching and learning should help learners develop their abilities, motivation and desire to play an active role in finding solutions to problems and issues in the society. Instructional leadership is a very important dimension because it targets the school's central activities, teaching and learning (Bush, 2007:401).

Educators must have all the necessary information required for the implementation process then they would take ownership of the changes that are implemented and be more positive about it.

Educator's ability to make sense of curriculum policy must be taken into account as sufficient time must be devoted to educator training which must be more informative and regular. DCS and DoE must have a common understanding of how they would enhance training to successfully manage curriculum policy implementation process.

It is therefore necessary to find appropriate professional development approaches to ensure that all the educators, even the most experienced and senior ones are equipped with the necessary knowledge and skills for improving learner and teacher performance. Furthermore instructional leadership involves developing a common vision of good instruction, building relationships, and empowering staff to innovate (Day et.al 2020 and Jones, 2010: 38).

Once the training from both DCS and DoE is concluded, it becomes the responsibility of the school managers to provide follow- up training through staff development workshops because these could be used as a platform to identify areas of concern and solutions. This is in line with the statement "People need to be given the opportunity to talk about their fears and concerns, both in groups and individually" by the Department of Education: (DOE, 2001: 27).

The Department of Correctional Services needs to increase funding for their formal education directorate. This would be dedicated to the improvement of infrastructure that will be customised in line with the expected school structures. Some of Correctional Centres were formally intended to house offenders and were not designed for schooling purpose.

Effective management of curriculum policy implementation will not work without adequate resources and necessary skills for the education managers and educators. The need for high quality professional development is imperative for improving quality education in DCS schools.

Curriculum policy management and its implementation is the responsibility of the Section Head/Principal and his management team. Their roles differ and complement each other. Gordon (2019) and Foran (1990:9) refers to instructional leadership as clinical supervision and the best way to improve instruction.

DCS schools must develop a common financed post establishment (SMT- Principal, Deputy Principal and Head of Department). This will allow the smooth running and shared responsibility towards managing curriculum policy implementation.

The DCS and DoE should train members of SMT's on how to monitor, evaluate and support educators in terms of new teaching methodologies.

Educators should possess learning area matter knowledge, pedagogical knowledge and content knowledge.

Educators should count on their Section Heads/Principals as resources of information on current trends and effective instructional practices. Instructional leaders are tuned-in to issues relating to curriculum, effective pedagogical strategies and assessment.

It is imperative for all educators to know the learning outcomes of the learning areas they are teaching. The HODs for various learning areas should empower educators and ensure that they understand the learning outcomes of the learning areas they are responsible for, for improved learner achievement.

Limitations of the Study

The researcher identified the following as some of the possible limitations that are related to this study: The main limitation of this research was that a case study was informed by Correctional Centres schools in North West and Gauteng only. It was further influenced by the fact that research sites were in close proximity to the researcher, Time and financial constraints, and travelling distance had a bearing in the selection of research sites.

A further limitation was that the five (5) participants interviewed were too few because most of the Section Head/Principal's that had agreed to form part of this research did not honour the interview agreement schedule. The views of the SMT at those schools cannot be generalised to reflect views of SMT at other Correctional Services schools.

A larger number of participants from more schools might have contributed to a variety of responses thus enriching the findings. Follow-up interviews could have added to the richness of the conversations. A final limitation as with any qualitative research project is that this study is not intended to be generalised as a finding that could be applied elsewhere. Outcomes of similar studies at other Correctional Centres schools can, however, are compared for results and trends.

The researcher is an educator within Correctional services of which on its own can take a form of a limitation. The position of the researcher therefore can possibly have an influence on the views and perceptions of both fellow educators and managers in DCS. Furthermore, variation of power relation could be detected during data collection stage as with fellow educators' interviews were dominated by features of collegiality and some form of expectation for immediate change to the educational practices of DCS education system. As for managers, the interview questions were somehow viewed as a form of challenging their managerial skills and practices and furthermore as a fault-finding mission.

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Annexure A: Interview Schedule

<u>**Preamble**</u>

The following interview schedule is used to collect relevant data as well as guide the participant during the interview. Participants were allowed to openly discuss their experiences concerning the managing curriculum policy implementation at correctional centres in selected South African provinces.

<u>**OpeningRemarks**</u>

- The participants are welcomed.
- Anonymity and Confidentiality are confirmed, and it is indicated that the participant's name will not be revealed in any way.
- Permission is requested from participants to record the interview.
- Participants are informed that they can refuse to answer any question or discontinue at any time during the interview.
- The research objectives are briefly explained.

<u>**Interview Questions**</u>

- What is the status quo of the management of curriculum policy implementation in your school?
- What instructional leadership roles do education managers play in the management of the curriculum implementation?
- Do educationists have sufficient skills and knowledge of managing the curriculum implementation?
- What are the perceptions of educationists on managing the curriculum implementation?
- What form training and support should be provided to educationists in the managing of the curriculum implementation?

Young Wise
Publishing

Research Article

Comparison of critical thinking dispositions of gifted students in support education (enrolled with SACs) and formal education

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Article Info	Abstract
	Critical thinking is the ability of individuals to reason against events, facts, situations, and to analyze and evaluate problem situations. It is the ability to reveal the difference between the arguments between the lines and rhetoric while using elements such as reading, writing, speaking and listening, which are the four basic language skills. The main purpose of this research is to determine the critical thinking dispositions of primary school students diagnosed with gifted. In line with this main purpose, the relationships between students' grade levels, gender, number of siblings, education levels of parents, whether students are gifted or not, their ability to express their thoughts in the family and their critical thinking tendencies will be revealed. In the study, it will be structured using the survey model design, which is one of the quantitative research methods. With the survey model, the critical thinking tendencies of gifted primary school students will be determined in the research. In addition, the relationships between critical thinking dispositions and variables such as grade level, gender, number of siblings, education level of parents, ability to express their thoughts at home will also be examined. The study group of the research consisted of third and fourth grade students studying in the provinces and districts of Tokat and receiving education in Science and Art Centers with 55 gifted, and 187 students with average talent. Thus, a total of 242 students took part in the study group of the research. The data in the research were obtained by using the 'Critical Thinking Tendency Scale for Primary School Students' developed by Uluçınar and Akar (2021). Consisting of 18 items in total, the scale consists of four sub-dimensions. Alpha reliability coefficient of the scale was found .80. The data obtained in the research were analyzed with the help of SPSS package program. Before starting the analysis of the data, normality analyzes were made and as a result of the analysis, Independent Sample t-Test and ANOVA tests were used for the data showing normal distribution of the data. The Kruskal Wallis Test was applied to the data that were not normally distributed. According to the research findings, the critical thinking dispositions of the gifted students were at a good level. No statistically significant difference was found between the critical thinking dispositions of gifted students and the sub-dimensions of the scale, as well as their grade levels, gender status, number of siblings, and parental education status. A significant difference was found in favor of the gifted students between the Science and Art Center students who were diagnosed with gifted and those who continue their education in their regular schools. In addition, the critical thinking dispositions of gifted students who always express their thoughts in the family were significantly higher than those of the gifted students who sometimes express their thoughts.

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Introduction

Thinking skill is a human-specific phenomenon and affects the decision-making process of the individual. An individual has to make decisions at every stage of his life. However, these decisions are sometimes expressed as right and sometimes

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wrong in terms of their consequences. The most important skill that will increase the accuracy of personal decisions both in terms of quality and quantity is critical thinking skill. Critical thinking skills are first acquired with the closest social environment of the individual, and it is expected to develop with the school period. Instructors argue that critical thinking skill is an important skill that should be acquired by students (Alharbi, 2022; Costa, 2001; Lipman, 2003). Especially in the 21st century, where economic, technological, social and societal change accelerates, critical thinking skills are the most basic competencies.

Critical thinking is the ability of individuals to reason against events, facts, situations, and to analyze and evaluate problem situations. It is the ability to reveal the difference between arguments and rhetoric while using the basic four language skills such as reading, writing, speaking and listening. Being able to make the right decisions with the ability to think critically is a characteristic that every person should have, and it is a very important condition for the mental development of individuals (Çıtak & Uysal, 2012). Because, while thinking keeps the mind active, critical thinking establishes connections between concepts and facts, reveals relationships and activates the decision-making mechanism. Thus, new connections are formed between neurons and the neuroplasticity ability of the brain develops. With this ability, learning becomes active and permanent. From this point of view, critical thinking skill not only improves the decision-making ability of the individual, but also strengthens the learning ability.

The rapid change in science and technology, the changing needs of the individual and society, innovations and developments in learning and teaching theories and approaches have also directly affected the roles expected from individuals (Güleç, 2020). This change can be produced by people who can produce information, use it functionally in life, solve problems, think critically, be entrepreneurial, determined, have communication skills, empathize, contribute to society and culture, etc. defines an individual with qualifications (Ministry of National Education, 2019). One of the 21st century skills emphasized in the learning process in primary school is critical thinking skills (Fajari, 2021). The learning processes, quality of life, and success in life of students who acquire this skill continue to increase. At the same time, it increases the individual's social and social communication skills. Therefore, critical thinking skills are an important acquisition that should be included in educational curricula (Barell, 2003). While defining the roles expected from the individual in the curriculum of the Turkish education system, the skill of being a 'critical thinker' is also described.

Attitudes are tendencies that guide skills and abilities. There are tendencies that also affect critical thinking skills. These are tendencies such as curiosity, flexibility, honesty, open-mindedness, analytical, self-confidence, and systematicity. Critical thinking dispositions are of great importance for individuals to have critical thinking skills, which is one of the important skills of today. Critical thinking tendencies turn into critical thinking skills. In addition, it removes the obstacles standing in the way of critical thinking skills. For this reason, it is expected that individuals' critical thinking tendencies are determined, deficient skills are gained, and existing ones are developed.

Gifted students are special children for whom countries set political goals for their future. Therefore, enriched education programs are applied for gifted students. These students pass certain intelligence and ability tests to determine whether they are gifted or not. Gifted are determined and developed. In Turkey, gifted students are identified by going through various evaluation stages. Students diagnosed with gifted can receive supportive education at their own school. In addition, Science and Art Centers established in Turkey implement support education programs for gifted students. Gifted students go to Science and Art Centers outside their own schools and receive education in line with their abilities. It is expected that critical thinking skills and tendencies of these children, who are selected from certain stages and who are superior to their peers, are also superior.

It is an important element to gain critical thinking skills to gifted students. However, besides this, students' current critical thinking tendencies should also be determined. A general situation can be revealed. Obstacles and tendencies in front of critical thinking skills can be determined. In line with this profile, the adequacy of students' critical thinking skills in today's conditions can be discussed and an explanation can be made about the issues that need to be developed. Thus, gains related to tendencies that support critical thinking skills can be included in curricula. Educational-political steps can be taken to develop critical thinking skills of gifted students, one of the 21st century skills. Therefore, it is very

important to determine the critical thinking skills of gifted students and to examine their relationship with different variables.

When the literature is examined, it has been observed that the relationships between different variables, learning approaches, problem solving skills and critical thinking skills of nursing students, science students, education faculty students, health school students, physical education department students, secondary school students are examined (Çalışkan, 2009; İskender et al. Karadağ, 2015; Saçlı and Demirhan, 2008; Tümkaya, 2011; Türnüklü and Yeşildere, 2005; Yıldırım and Şensoy, 2011). As for the critical thinking skills of primary school students, it has been observed that studies have been conducted in terms of their relationship with course success, reading time, gender, TV watching time, and social studies course (Akar & Kara, 2016; Demir, 2006). However, no study was found on the relationship between critical thinking dispositions of gifted primary school students and variables such as parental education status, gender status, grade level, special education status, number of siblings, and critical thinking dispositions.

With this research, critical thinking dispositions that affect the problem solving, thinking, reasoning, analysis and evaluation skills of primary school third and fourth grade students diagnosed with gifted were examined in terms of various variables. With the study, an answer will be sought to the question of "at what level are the critical thinking dispositions of gifted students?". Below the sub-problems:

➤ Is there a statistically significant difference between students' critical thinking dispositions and grade levels/gender/number of siblings/mother' education level/father' education level/being gifted?

Method

Model of the Research

The study was structured using the survey design, which is one of the quantitative research methods. Survey research is the process of collecting data to determine the characteristics of a particular group (Büyüköztürk et al., 2014). In this study, critical thinking tendencies of gifted primary school students will be determined. In addition, the relations between critical thinking dispositions and grade level, gender, number of siblings, education level of mother and father, and special education status will also be examined.

Participants

The study group of the research consisted of third and fourth grade students studying in Tokat province and its districts. In Turkey, students pass through various assessment stages and are diagnosed with gifted. These identified students start to study at Science and Art Centers. Therefore, the data of the gifted students were obtained from the students of the Science and Art Center located in Tokat and its districts. 55 gifted students participated in the study. In addition, one of the sub-problems is to determine whether critical thinking disposition is the feature that distinguishes gifted students. Therefore, data on critical thinking disposition of students with 187 average abilities were also collected. Demographic information for the students participating in the study is shown in Table 1.

Table 1. Demographic Information of Gifted Students Participating in the Study

Variable	Group	n	%
Grade level	Third grade	20	36,4
	Fourth grade	35	63,6
Gender	Girl	28	50,9
	Boy	27	49,1
Number of siblings	A sibling	4	7,3
	Two siblings	34	61,8
	Three siblings	13	23,6
	Four siblings and above	4	7,3
Mother education	Primary education	14	25,5
	High school	11	20,0
	University	30	54,5
Father education	Primary education	9	16,4

	High school	14	25,5
	University	32	58,2
Ability to express thoughts	Anytime	29	52,7
	Sometimes	26	47,3
	I don't express	0	0

When Table 1 is examined, 36.4% (N=20) of the gifted students participating in the research are third grade students and 63.6% (N=35) are fourth grade students. 50.9% (N=28) of these students are female and 49.1% (N=27) are male students.

In the research, the relationship between gifted students and students with average ability was also examined. The number of gifted and average talents of the students who participated in the study are shown in Table 2.

Table 2. The Status of Being Gifted

Variable		f	%
Being gifted	Gifted	55	22,73
	Nongifted	187	77,27

When Table 2 is examined, 22.73% (N=55) of the students participating in the research are gifted students and 77.27% (N=187) are students with average talent.

Data Collection

The data in the research were obtained by using the 'Critical Thinking Tendency Scale for Primary School Students' developed by Uluçınar and Akar (2021). Critical thinking disposition scale consists of 18 items and four sub-dimensions. The sub-dimensions were named as 'Maturity and Open-mindedness, Mindfulness and Skepticism, Curiosity and Questioning, Bias and Objectivity'. Students are asked to respond to the scale items prepared in a four-likert type with one of the levels of 'never, sometimes, most of the time and always'. The lowest score that can be obtained from the scale is 18, and the highest score is 72. The higher the score, the higher the critical thinking skill level. Alpha reliability coefficient for the data collection scale was calculated and the results are shown in Table 3.

Table 3. Alpha Reliability Analysis of the Scale in General and Its Sub-Dimensions

Dimension	Alpha
Maturity and Open-Minded	.67
Caution and Skepticism	.71
Curiosity and Questioning	.82
Bias and Objectivity	.71
Critical Thinking Tendencies	.80

According to Kılıç (2016), if the Alpha reliability coefficient is above .60, the scale is at an 'acceptable' level. In this study, it is seen that the reliability coefficient for the whole scale and its sub-dimensions is greater than .60. Before starting the collection of research data, the necessary legal permissions for data collection were obtained from the Tokat Provincial Directorate of National Education. In addition, consent was sought from the families of the students regarding the collection of data. In the research, the data were obtained by the researcher by going to the classrooms of the students. Before starting data collection, students were given detailed information about the research and answering the scale. Then the scale was distributed to the students and collected again after being answered by the students.

Data Analysis

The data obtained from the students were loaded into the SPSS package program and made analyzable. Normality tests were performed to decide with which tests to analyze the data. Information on the normality of the data is given in Table 4.

Table 4. Normality Analysis of Research Data

Variable	Group	Kolmogorov-Smirnov	Skewness	Kurtosis	Applied Test
Grade Level	Third grade	.20	.039	-1,046	Independent t-Test
	Fourth grade	.20	-.319	-.341	
Gender	Girl	.16	-.505	-1.072	Independent t-Test
	Boy	.20	.199	-.092	
Number of siblings	A sibling	.00*	-.265	.443	Kruskal Wallis
	Two siblings	.16	-.349	-.639	
	Three siblings	.20	-.442	.209	
	Four siblings and above	.00*	1,643	3,038	
Mother education	Primary education	.20	.76	1,117	One Way ANOVA
	High school	.20	.136	-1,527	
	University	.19	-.828	.027	
Father education	Primary education	.20	.781	.743	One Way ANOVA
	High school	.20	-.186	-1,259	
	University	.20	-.523	-.276	
Ability to express thoughts	Anytime	.20	-.181	-.703	Independent t-Test
	Sometimes	.20	.117	-.218	

When Table 4 is examined, it is seen that the Independent Sample t-Test and One-Way ANOVA Test were applied in the analysis of normally distributed data. In the analysis of non-normally distributed data, the analysis was performed with the Kruskal Wallis Test. The score ranges in Table 5 were used to evaluate students' critical thinking dispositions.

Table 5. Critical Thinking Tendencies Scale Mean Scores Ranges

Desk	Score Range	Trend Level
1	1,00 –1,75	Weak tendency
2	1,76 – 2,50	Medium trend
3	2,51 – 3,25	Good trend
4	3,26 – 4,00	Strong trend

Results

The critical thinking disposition mean scores of the students participating in the research were calculated. The obtained information is presented in Table 6.

Table 6. Students' Critical Thinking Dispositions Mean Scores

Dimension	Gifted			Average Skilled		
	N	$\bar{X}$	ss	N	$\bar{X}$	ss
Maturity and Open-Minded	55	3,28	.65	187	2,98	.63
Caution and Skepticism	55	2,99	.64	187	2,62	.66
Curiosity and Questioning	55	3,05	.75	187	2,56	.66
Bias and Objectivity	55	2,72	.72	187	2,72	.71
Critical Thinking Tendencies	55	3,01	.46	187	2,71	.41

When Table 6 is examined, it can be stated that the critical thinking dispositions of the gifted students ($\bar{X}$=3.01) and the students with average ability ($\bar{X}$=2.71) are at the level of 'good disposition' when the mean scores for the whole scale are examined.

In the study, the relationship between the critical thinking dispositions of gifted students and their grade levels was examined using the Independent Sample t-Test. Information on the results of the analysis is given in Table 7.

Table 7. The Relationship Between Students′ Critical Thinking Dispositions and Grade Levels

Dimension	Variable	N	$\overline{X}$	ss	t	sd	p
Maturity and Open-Minded	Third grade	20	3,3250	.61825	.37	53	.71
	Fourth grade	35	3,2571	.67651			
Caution and Skepticism	Third grade	20	2,9100	.65687	.65	53	.52
	Fourth grade	35	3,0286	.63827			
Curiosity and Questioning	Third grade	20	2,8100	.81943	1,74	53	.09
	Fourth grade	35	3,1886	.69102			
Bias and Objectivity	Third grade	20	2,6875	.63802	.25	53	.81
	Fourth grade	35	2,7357	.77636			
Critical Thinking Tendencies	Third grade	20	2,9250	.46105	1,04	53	.31
	Fourth grade	35	3,0587	.46029			

When Table 7 is examined, no statistically significant difference was found between students′ critical thinking dispositions and grade levels (p>.05). There was no statistically significant difference between the sub-dimensions of the scale of critical thinking dispositions and the grade levels of gifted students (p>.05).

The relationship between the critical thinking dispositions of gifted students and their gender status was examined using the Independent Sample t-Test. Information on the results of the analysis is given in Table 8.

Table 8. The Relationship Between Students′ Critical Thinking Dispositions and Gender Status

Dimension	Gender	N	$\overline{X}$	ss	t	sd	p
Maturity and Open-Minded	Girl	28	3,2768	.67474	-.058	53	.95
	Boy	27	3,2870	.63815			
Caution and Skepticism	Girl	28	2,9571	.59717	-.331	53	.74
	Boy	27	3,0148	.69487			
Curiosity and Questioning	Girl	28	3,0786	.80432	.275	53	.78
	Boy	27	3,0222	.71540			
Bias and Objectivity	Girl	28	2,7411	.73435	.237	53	.81
	Boy	27	2,6944	.72501			
Critical Thinking Tendencies	Girl	28	3,0139	.47686	.062	53	.95
	Boy	27	3,0062	.45274			

When Table 8 is examined, no statistically significant difference was found between the students′ critical thinking skills and their gender status in the whole scale and its sub-dimensions (p>.05).

In the study, the relationship between the critical thinking dispositions of gifted students and the number of siblings was also examined. The results of Kruskal Wallis analysis on the difference between the critical thinking dispositions of gifted students and the number of siblings are shown in Table 9.

Table 9. The Results of Kruskal Wallis Analysis Regarding the Difference Between Critical Thinking Dispositions and Number of Siblings

Dimension	Number of Siblings	N	Rank Average	X^2	sd	p
Maturity and Open-Minded	A sibling	4	35,00	5,78	3	.12
	Two siblings	34	30,87			
	Three siblings	13	21,46			
	Four siblings and above	4	17,88			
Caution and Skepticism	A sibling	4	26,88	2,89	3	.42
	Two siblings	34	28,88			
	Three siblings	13	29,96			
	Four siblings and above	4	15,25			
Curiosity and Questioning	A sibling	4	19,00	2,30	3	.51

	Two siblings	34	30,12			
	Three siblings	13	26,62			
	Four siblings and above	4	23,50			
Bias and Objectivity	A sibling	4	24,75	1,13	3	.77
	Two siblings	34	28,56			
	Three siblings	13	29,69			
	Four siblings and above	4	21,00			
Critical Thinking Tendencies	A sibling	4	24,50	3,00	3	.39
	Two siblings	34	30,46			
	Three siblings	13	25,96			
	Four siblings and above	4	17,25			

When Table 9 is examined, it is seen that there is no statistically significant difference between the critical thinking dispositions of gifted students and the number of siblings (p>.05). In the study, the relationship between the critical thinking dispositions of gifted students and their mother's educational status was also examined. The results of the one-way analysis of variance regarding the difference between the critical thinking dispositions of gifted students and their mother's educational status are shown in Table 10.

Table 10. One-Way Analysis of Variance Results of the Difference Between Critical Thinking Dispositions and Mother Educational Status

Dimension		Sum of Squares	sd	Mean Squares	f	p
Maturity and Open-Minded	Between groups	1,632	2	.816	1,997	.146
	In-group	21,249	52	.409		
	Total	22,882	54			
Caution and Skepticism	Between groups	1,519	2	.759	1,907	.159
	In-group	20,710	52	.398		
	Total	22,228	54			
Curiosity and Questioning	Between groups	2,320	2	1,160	2,117	.131
	In-group	28,498	52	.548		
	Total	30,817	54			
Bias and Objectivity	Between groups	1,047	2	.523	1,000	.375
	In-group	27,210	52	.523		
	Total	28,257	54			
Critical Thinking Tendencies	Between groups	1,138	2	.569	2,863	.066
	In-group	10,332	52	.199		
	Total	11,470	54			

When Table 10 is examined, it is seen that there is no statistically significant difference between the educational status of mothers and their critical thinking dispositions (p>.05).

In the study, the relationship between the critical thinking dispositions of gifted students and their father's educational status was also examined. The results of the one-way analysis of variance regarding the difference between the critical thinking dispositions of gifted students and their father's educational status are shown in Table 11.

Table 11. One-Way Analysis of Variance Results of the Difference Between Critical Thinking Dispositions and Educational Status of Fathers

Dimension		Sum of Squares	sd	Mean Squares	f	p
Maturity and Open-Minded	Between groups	.806	2	.403	.949	.394
	In-group	22,076	52	.425		
	Total	22,882	54			

Caution and Skepticism	Between groups	.360	2	.180		
	In-group	21,869	52	.421	.428	.654
	Total	22,228	54			
Curiosity and Questioning	Between groups	1,783	2	.891		
	In-group	29,035	52	.558	1,596	.212
	Total	30,817	54			
Bias and Objectivity	Between groups	.576	2	.288		
	In-group	27,681	52	.532	.541	.586
	Total	28,257	54			
Critical Thinking Tendencies	Between groups	.696	2	.348		
	In-group	10,773	52	.207	1,680	.196
	Total	11,470	54			

When Table 11 is examined, it is seen that there is no statistically significant difference between the father's education status of gifted students and their critical thinking dispositions (p>.05).

In the study, the relationship between the critical thinking dispositions of gifted students and students with average ability was also examined. The Independent Sample t-Test results regarding the critical thinking dispositions of gifted and average talented students are shown in Table 12.

Table 12. The Relationship Between Students' Critical Thinking Dispositions and Gifted Status

Dimension	Being Gifted	N	$\bar{X}$	SS	t	sd	p
Maturity and Open-Minded	Gifted	55	3,28	.65095	3,05	240	.00
	Nongifted	187	2,98	.62856			
Caution and Skepticism	Gifted	55	2,99	.64159	3,67	240	.00
	Nongifted	187	2,62	.66395			
Curiosity and Questioning	Gifted	55	3,05	.75544	4,38	240	.00
	Nongifted	187	2,56	.65998			
Bias and Objectivity	Gifted	55	2,72	.72338	-.022	240	.98
	Nongifted	187	2,72	.70744			
Critical Thinking Tendencies	Gifted	55	3,01	.46087	4,41	240	.00
	Nongifted	187	2,71	.41172			

When Table 12 is examined, it is seen that there is a statistically significant difference between the average score of the gifted students ($\bar{X}$=3.01) and the average score of the students with average talent ($\bar{X}$=2.71) (p<.05). When the mean scores are examined, it is seen that this difference is in favor of the gifted students.

In addition, it is seen that there is a significant difference in favor of gifted students in the sub-dimensions of maturity and open-mindedness, carefulness and skepticism, inquisitiveness and questioning (p<.05). No statistically significant difference was found in the bias and objectivity sub-dimension of the scale (p>.05).

In the research, the relationship between the critical thinking dispositions of gifted students and their ability to express their thoughts in the family was also examined. The results of the one-way analysis of variance regarding the difference between the critical thinking dispositions of gifted students and the level of expressing their thoughts within the family are shown in Table 13.

Table 13. One-Way Analysis of Variance Results Regarding the Difference Between Critical Thinking Dispositions and Expression Levels

Dimension	Veriable	N	$\bar{X}$	ss	t	sd	p
Maturity and Open-Minded	Anytime	29	3,52	.55473	3,01	53	.00
	Sometimes	26	3,02	.65925			
Caution and Skepticism	Anytime	29	3,07	.59588	1,01	53	.31
	Sometimes	26	2,89	.68872			
Curiosity and Questioning	Anytime	29	3,33	.69750	3,13	53	.00

	Sometimes	26	2,74	.70375			
Bias and Objectivity	Anytime	29	2,78	.75399	.62	53	.54
	Sometimes	26	2,65	.69670			
Critical Thinking Tendencies	Anytime	29	3,18	.44792	3,05	53	.00
	Sometimes	26	2,82	.40785			

When Table 13 is examined, a statistically significant difference was found between the mean score of the gifted students who always express their thoughts in the family (N=3.18) and the mean scores of the gifted students who sometimes express their thoughts (N=2.82) (p<. 05). When the mean scores are examined, it is seen that this difference is in favor of the students who always express their thoughts in the family.

When the sub-dimensions of the scale are examined, it is seen that there is a significant difference in favor of gifted students in terms of maturity and open-mindedness and inquisitiveness and questioning (p<.05). However, no significant difference was found in the dimensions of caution and skepticism, and bias and objectivity (p>.05).

Discussion and Conclusion

As a result of the research, it was determined that critical thinking disposition is a distinctive feature for gifted students. Similarly, gifted students have more mature, open-minded, careful, skeptical, curious and questioning personalities in terms of critical thinking disposition than average gifted students. Expressing their thoughts at home supports gifted people to be critical thinkers. Again, it has been observed that students who constantly express their thoughts at home have a more mature, open-minded, curious and questioning personality in terms of critical thinking dispositions. The grade levels, genders, number of siblings and educational status of parents do not affect critical thinking dispositions of gifted students.

In the studies of Ocak and Kalender (2017) and Köksal and Çöğmen (2018), it was determined that female students' critical thinking skills are at a higher level than males. However, as a result of this research, it was seen that the critical thinking dispositions of gifted students were not affected by gender. The reason for this difference can be attributed to the good and distinctive level of critical thinking dispositions of gifted students. Since gifted students have strong critical thinking dispositions, it can be stated that this difference at the gender level is closed.

Critical thinking skill is expressed as an important power and inherent ability of gifted students (Heller, 2005; Renzulli, 2005; Ziegler & Stöger, 2004). The results of this study support this statement. Supporting students' strengths will increase their self-confidence and improve their ability to express themselves. Therefore, as Köksal, Göğsu and Akkaya (2017) stated in their studies, gifted students should receive critical thinking skills training in their education life.

No significant relationship was found between students' critical thinking skills and grade levels. A similar situation was found in the studies of Aral (2005), Kösal and Çöğmen (2018). However, in some studies, it has been determined that critical thinking skills have a positive relationship with age and grade level (Ay & Akgöl, 2008; Kahraman, 2008). Knowledge and experience are of great importance in acquiring critical thinking skills. Students' knowledge and experience levels can be affected by factors such as age and educational status. Therefore, it may be expected that there is a positive relationship between critical thinking skills and grade level. However, it can be said that the reason why gifted students are not detected is that the students increase their knowledge and experience at the same level due to their giftedness. This similarity may be the reason why the difference in critical thinking disposition among gifted students did not change depending on the grade level. In addition, in this study, the change between the third and fourth grade levels was examined. As the grade level difference increases, the direction and size of the relationship between gifted and critical thinking disposition may also change.

Recommendations

Based on the research results, the following suggestions can be expressed;

➢ Critical thinking disposition, which is a distinctive feature for gifted students, can be used in the process of identifying gifted students.

➢ In the education programs applied for the development of critical thinking skills of gifted students, learning outcomes aimed at revealing, developing and supporting critical thinking dispositions can be included.

➢ Critical thinking dispositions of gifted students who express themselves were found to be stronger. Therefore, gifted students should be given the opportunity to speak and express themselves at home, at school and in their social environments.

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