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# Semantic Relations of Humor: A Study of *ADA Tongeng To Liseé*

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**Abstract**

*This study aims to describe the semantic relations of humour to Liseé. The data was in the form of humorous discourse ada tongeng from the Bugis Lise community. The data were analyzed by using the identity and distributional method. The findings show that there are six types of semantic relations of humour To Liseé, including: (1) 32 polysemes, (2) 4 antonyms, (3) 2 hyponyms, (4) 1 synonym, and (5) 2 homonyms.*

***Keywords:*** *Semantic Relations, Ada Tongeng, To Liseé.*

## A. Introduction

*Mangkangului ri bulué, massulappéi ri tanetéé, mattoddangi ri tapparengé.* 'there are a mountain range at the head, a plain in the middle, and a lake at the bottom'. Those are the boundaries of the Lise Village expressed in the Buginese language. These expressions are not only implying the Lise village boundaries but also describe its topographical conditions.

The Buginese inhabits several areas in South Sulawesi. One of which is Sidenreng Rappang (Sidrap) Regency. Panca Lautang is one of the six districts of Sidrap Regency. This district oversees four villages, one of them is Lise Village (Monogtaphs on Lise Village, 1988: 3). Lise Village has situated 7 km from the capital district, and ± 222 km from Makassar (provincial capital). Geographically, the location of Lise Village is less favourable because it is far from the provincial capital. However, it is not a remote village because there is much public transportation found there, both from the capital district of Sidrap and the provincial capital of South Sulawesi have a direct 'route' to Lise Village.

The name Lise Village comes from the Buginese language, namely the word *Lise* that means 'content'. Then, the word *malisse* is a derivate of *lise*. The word *malisse* is used to express an object that has content. It is said that *Tau Matanréé* 'high-ranking people' once said the word *malisse*, precisely the phrase *tau mallise* 'people densely filled up' to seven brothers from the *Lise* are. The seven brothers have different capabilities. These capabilities are in the form of knowledge and skills, including: (1) *Macca pannennai leppi lipaé* 'theologian'. (2) *Macca mattuttung, maccato cénga missengi lao-laona anak wittoéngé* 'good at reading and understanding astronomy'. (3) *Macca pakkinang onroi repoé* 'architect'. (4) *Macca pangoloi tau mabbokoé, nannia maccato bali ada* 'technocrat'. (5) *Macca passawéi wisésaé, iyatonaro tau magetteng ri ada pettunna* 'an honest and agricultural expert'. (6) *Macca pabicarai tau séngngoé* 'expert in commanding crocodiles[1] and in the field of fisheries. (7) *Macca paréwék sumangei tau malasaé, nannia tau madisengé* 'health counsellor, encourages sick and healthy

[1] Can communicate with crocodiles. The crocodiles are likened to *tau séngngoé* 'nasal person'. This means that crocodiles also understand the will of such person, let alone fellow humans. Basically, they are negotiator.

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person'. The statements above show that the *Lise* people have always longed for expertise and intelligence. It is proven that they have speaking skills that they can be proud of, until now.

The *Lise* people have long been known for their *mallécco-lécco ada*. However, Lise people realize that in *Lécco-lécco ada* there is the meaning of "*play around"*, an—insincere action—that seems oriented towards something (Lersen-Freeman, 1980: 154). A disinterested orientation is a realization of "play" is different from "reality". Play is encouraging, voluntary, and has a purpose in itself. This way of speaking is considered childish by other Bugis. The speech, seen as an attempt to attract excessive attention but sometimes appropriate too. The non-lise Bugis called it *konok-konokeng* (Pertiwiningsih, 2000:5)

The use of *lécco-lécco ada* 'play on words seems to deceive an intercolutor, at least as diplomatic action is taken to prevent conflicts. Lastly, in every speech event, it will just a humour. According to Lise people, such an understanding is considered not to reflect seriousness, belittling their ethnic group, and so on. As a result, they feel embarrassed if *lécco-lécco ada* is associated with their ethnic group. That's one of the reasons why the Lise people don't agree with the term *lécco-lécco ada*, but they call this speech style with *ada tongeng 'accuracy of words* because it can be used to solve serious social and community problems. Their acceptance of the term *lécco-lécco ada* is just a form of tolerance for the outside world.

A different phenomenon shows that other tribes in Indonesia consider the Bugis--including the Lise people—to have a strong character. But, they appreciate the values of *sipakatau* and *sipakalebbi* 'humanizing and respecting each other', Violation of these two values causes "harm". On the other hand, they are also friendly and loyal (Pelras, 1996: 4). The friendly and loyal character arises because he appreciated the honor, both for his own and others. In such friendly conditions, it is not impossible to appear humour and jokes. These are the two contradictory but complementary characters in the Bugis.

According to Lise people, the speech style using *lecco-lecco ada* is not to make fun of people or to get a funny feeling. They just want to tell the truth, according to what they see, know, and feel. For them, *lécco-lécco ada* is more accurate to call *ada* tongeng 'accuracy of words' which they are proud of as honesty and skill in speaking. *Ada* Tongeng is a form of speech that requires precise interpretation of certain parts or the entire linguistic structure. If in the end there is a fairy tale that makes a funny impression, that's a different matter and not the main goal

The speaking habit of using *lecco-lecco ada* is also shared by other Bugis groups.[2] If there are different perceptions of similar speech styles, then the differences lie in the perspective of each ethnic group. This is in line with research conducted by Gumperz, Scollon & Scollon, and Roberts (Gumperz, J.J. 1998). He said that the transfer characteristics of conversational competence between languages resulted in more serious consequences than syntax or pronunciation problems. The hallmark of conversational competence is related to self-representation, namely, how to communicate one's self-image to others (Ismari, 1995: 25). Differences in the principle of perspective can create a false impression about someone.

The interlingual system should not be described in contrast. Because language is the result of meaningful activity, related to the place in social interaction. According to other tribes, the Bugis have a strong character and are highly value honour, so they are at risk of harm. On the other hand, they are also friendly and loyal (Pelras, 1996: 4). These characters are formed because he appreciated the honour, both for his own and others. . In such friendly conditions, it is not impossible to appear humour, play and jokes. Those are contradictory, complementary characters in the Bugis

[2] For example, the Bone folklore told about the intelligence of Kajao La Lido when the king sent to look for a hundred blind people in one night.

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The Lise people have motto motto *lebbi maté temmanré namaté temmappao(u)* 'it is better to die not eating than to die not talking'. According to them, a person who cannot speak is dead. Maybe his mind, his steps, and even death in the sense of not living. Therefore, speaking skills are considered important by the people of Lise Village.

**B. Methodology**

This research departs from the assumption that nothing is trivial in the world, every possible cause becomes the key to understanding what is being studied. Such research seeks to produce descriptions, understandings, and meanings of a cause by highlighting its descriptive nature.

The research data is sourced from the oral discourse of the Lise community. The research data is limited to anecdotes. This research relies on data collection through field research[3] and literature studies as its support. The translation of text data into Indonesian was first carried out utilizing morpheme-by-morpheme translation according to the class category. Categorization is attempted to touch the meaning of each morpheme. After that, it is freely translated. To maintain translation consistency, computer assistance is needed with machine-aided human translation. The system depends on the researcher's language analysis (Cahyono, 1995: 243-244).

Various methods and techniques for providing data were chosen based on the view of the researcher is dealing with the research subject and the linguistic aspects under study. Thus, the role and function of the informant as a source of factual data is very important. For this reason, the informant is required with the following conditions; a) unites with the researcher and the object, b) is a microcosm of the linguistic and cultural structure, f) patient, honest, reliable, and cheerful (Samarin, 1991: 46-59). The data were analyzed using the equivalent and distribution method semantically from an operational semantic. The analytical model relies heavily on the role of macrocosmic reflection of the speaker's mental. This method is applied to determine the identity of the object based on the high level of equivalence and harmony with the determining tool that is outside the language.

**C. Discussion**

Aminuddin (1988) and Kempson (1989) formulated three different approaches of meaning; referential, ideational, and behavioural approaches. The referential approach views word meaning as representing reality as a result of the thought process. Each word has a specific meaning that refers to a substance directly (Kempson, 1989: 13). The word dog refers to the type of animal with a backbone, usually used as a pet, etc.

The ideational approach emphasizes the formulation of messages and the reception of information. Meaning is obtained through the bond of the essence with the concept. That is, the relationship between the symbol and its reference occurs indirectly due to the mental and personal roles of the speaker. That is, the relationship between the symbol and its reference occurs indirectly due to the mental and personal roles of the speaker. The word dog can be interpreted as a dog-like trait[4]. The meaning of a code is arbitrary but conventional, resulting in some semantic relations and changes in meaning. An ordinary word has many meanings, depending on the richness of the language, the diversity of nature, and the understanding of the listener.

Similar to the considerations above, the behavioural theory also questions the harmony of speaker-speaker understanding[5]. This approach pays close attention to speech situations and events. The concept departs from the process of contemplation as a mental process when people

[3] Observation and interview.
[4] Blindly loyalty.
[5] Arbitrary but conventional.

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try to understand things that are caught by the senses. That's when interpretation occurs to respond to and understand a symbol so that the ideas on the symbol can be tested through interpretation. For example; the word dog is referred to someone peeing on the fence. It means people who behave like dogs, defecate carelessly. Someone who asks; "Do you know where the post office is?", of course not expecting an answer; "Yes, I know".[6]

Kempson (1989) does not mind the differences between the three approaches. The three are more accurately thought of as a 3-level approach. Each level may be applied according to the required proposition.

The proposition is a unit of meaning in the form of an idea or idea. If there are several ideas, then among them there is the main idea as a clause builder. Other ideas serve as a barrier. The idea or ideas can be represented in various ways depending on the focus (Clark & Clark, 1977: 11-13). These ideas can also be combined through a system of relations if the proposition is a combination of concepts (Larson, 1989: 199-208).

**1. Semantic Factors.**

Language is not static. Language can be modified in certain directions, and it can also be manipulated to form other realities. In addition to conveying reality, language also functions creatively. Some of the factors that drive the change in meaning are as follows:

**a. Linguistic Factors.**

Semantic changes can be related to the contact between words in speech, for example, the words see and know, out and go, and so on.

**b. Historical Factors**.

Linguistic forms are generally more resistant than cultural forms. Even though the shape can survive, the meaning may change. The word humour (Old French), used to mean 'the four main elements that are considered noble, namely, coldness, sadness, calm, but optimism'.

**c. Social Factors.**

The speaking habit sometimes exceeds the linguistic requirements when it comes to special nomenclature. Socially, the change in meaning can be broad or narrow, for example, the change in the meaning of *tuan*, *saudara*, and *pala*.[7]

**d. Psychological Factors.**

Changes in meaning due to the tendency of the speaker's ideas. An interesting case is a change in meaning due to emotional and taboo factors. An example of a change in meaning due to emotional factors is the metaphor of the rooster from the east 'Sultan Hasanuddin', which is taboo from the word 'pee'.

**e. External Factors**.

Previously, the concept of saving time meant speeding up work and saving energy, now it also means saving money.

**f. The Need for a New Name Factors.**

The discovery of new objects and concepts due to the development of culture and science requires names that refer to them, for example, the word computer and weekends (Ullmann, 1983: 198-209).

**2. Semantic Relations.**

The types are described as follows. An ordinary reference has many different designations. Naming and meaning, although arbitrary, but conventional. Violation of conventions can lead to language confusion. Only in special situations, it might be acceptable. The meaning of semantic relation here is the type of relationship between the meaning of

[6] Not paying attention to the situation and behavior of the speaker.

[7] Etimologis; tuhan, berasal seperut, pahala.

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morphemes, words, phrases, clauses or sentences to one another. The relationship can be contextual or contextual.

**a. Synonym;**

Words with the same denotation, but different connotations (Tarigan, 1986: 17). So far, there is no axiom that there are actual synonyms (Ullmann, 1983: 141). Because the suspected words have the same meaning, the similarity will be invalidated by collocation factors, meaning components, or sentence context (Palmer, 1986: 89-93). But another fact shows that the collocation factor can make a word synonymous with other words, if; 1) the relationship is symmetrical (Lyons, 1979: 292), 2) still has the same meaning after being used in various sentences (Aminuddin, 1988: 117). Compare the words already (finished, ended, etc.) and already (sense of action, past, finished, etc.), or Betawi with Jakarta.

**b. Antonym**

An expression whose meaning is considered the opposite of the meaning of another expression. Some experts call it repositioning because it can include the concept of opposites and contrasts (Palmer, 1986: 94). For example, life is the opposite of death and black is the opposite of white.

**c. Polysemy**

Variations in the meaning of linguistic units due to changes in meaning components. Polysemy or not can determine if people; 1) understand etymology to achieve the basic meaning. The similarity of basic meaning is a polysemic characteristic, for example, the word ceremony[8] 'ritual in connection with an important event' and 'commemoration', 2) understanding the context. If a form is used as a metaphor, then the form is polysemy, for example, young leaves and girls (*daun muda* and *daun muda*). Examples of polysemy from other words with the same core meaning, for example, parents and oldster (*orang tua* and *orang tua)* (Aminuddin, 1988: 124-125).

**d. Homonym**

Expressions are either words, phrases or sentences that have the same shape but different meanings (Chaer, 1995: 93). For example:

| | Form | 1st Meaning | 2 Meaning |
|---|---|---|---|
| - | *Semi-/sprout* | - begin to grow | - half |
| - | *There is a medicaster giving a birth at the clinic* | - there is a medicaster giving a birth at the clinic | - there is a traditional birth attendant works at the clinic |

Table 1: Table of forms and meanings of homonyms

To avoid confusion with polysemy, it is necessary to pay attention to the provisions of the third item of polysemy. The similarity of the form may only concern the similarity of writing (homograph) or similarity of sound (homophone). It is explained as follows:

| Gloss | Homonym | Homophone | Homograph |
|---|---|---|---|
| 1. *bisa* and *bisa* (poison and can) | √ ≠ (meaning) | √ √ | √ ≠ (written) |
| 2. *bang* and *bank* (*bang* and *bank*) | √ | ≠ /tau/ | √ |

[8] - √car 'running'; transition from one stage to another (Macdonell, 1954).
- Ceremonies that done as solemn cermony, performed in a prescribed order.

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3. *tahu* and *tahu*
(*know* and *tofu*)

Table 2: Relationship between homonym, homophone, and homograph.

**e. Hyponym**

Hyponyms are expressions whose meaning is considered part of the meaning of other expressions according to the group's knowledge system (Verhaar, 1981: 137). To distinguish it from synonyms or polysemy, it is necessary to observe the relationship characteristics of the forms suspected of being homonyms. If a form has the characteristics of a transitive relationship, that is, something has the characteristics of something else (Lyons, 1979: 292), then the form is hyponymous. For example:

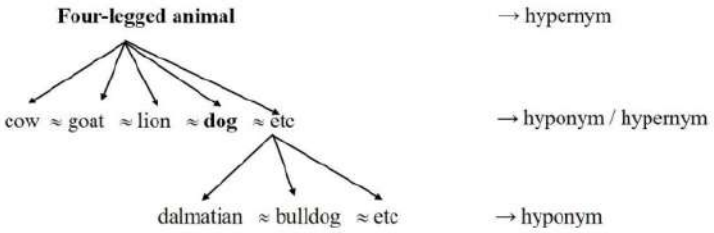


**Figure 1**: Hyponym hierarchy

In addition to these types of semantic relations, the term ambiguity is also known as a separate type of semantic relationship. Ambiguity can occur either because of synonyms, polysemy, homonyms, grammatical problems, ambiguous references, loose references, etc. (Ullmann, 1983: 157-159 and Kempson, 1977: 124). If so, the term ambiguity as a type of semantic relation category becomes confused with other categories, so it is less relevant to be discussed in this article.

**3. Core meaning of *Ada Tongeng***

Not all linguistic elements in *ada tongeng* are funny. The funny thing only lies in certain parts that have the "lame" proposition as a differentiator of the speech character concerned with other daily speech characters. That is the core part of the discourse that is the stimulus for the antics in the storytelling. The core of *Ada Tongeng*is generally preceded and ended by a series of other utterances. The core part is often mediated by utterances that are not so significant but are still an inseparable part of the discourse. There are single-nucleated and double-nucleated *Ada tongeng*. This part can be in the form of:

- A constituent whose meaning relation is related to the speaker's perlocution.
- Two different constituents are interrelated. Constituent I functions as a stimulant for constituent II. Constituent II is a reaction to constituent I.

The reaction or answer is an indication of a possible shift in meaning. If the point is in the form of two constituents, then the study starts from the first constituent based on the view that an effect must originate in a cause.

The meaning starts from the participants' understanding of the reality and situations supporting the discourse. This understanding forms an abstract proposition. From understanding reality to propositions, they are analyzed according to the meaning captured as a symbol of the meaning of each participant. The terms participants in the meaning scheme are

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broken down according to their turn into speakers and addressees. [9] When the symbol of the meaning of each participant is manifested as the core of *ada tongeng*, it usually has the potential to be the cause of changes in meaning between participants. This change occurs because of the encouragement of certain factors that are focused on propositions and are realized as symbols. The symbols in question are in the form of a linguistic form that can be sensed and can be analyzed.

If the auditory form of the symbol has the same meaning but different propositions, then there can be a difference in meaning. On the other hand, even in the same proposition, differences in meaning can still occur on purpose. The way of understanding is then juxtaposed with the form of symbols to observe the reaction that occurs next. The treatment will show changes as a form of linguistic reaction if the core is interpreted differently. In that case, the factors causing the changes in meaning are different from the factors driving the desire to change the meaning.

The analysis of *ada tongeng* is limited to paraphrases that trigger humour which shows the semantic relations. The form of semantic relations is determined as the core of *ada tongeng* from the point of view of each participant. This section is manifested as a rectangle, one of which implies a contextual translation. That part becomes the core problem in *Ada tongeng*. So that the form of meaning can be seen, then that part needs to be equipped with a meaning component. Example: [10]

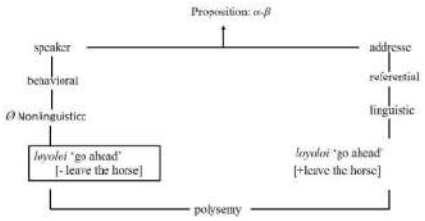


Figure 2. The analysis of *ada tongeng*

The visualization of the analysis of participant meaning in the scheme is attempted to illustrate the process of acquiring the core meaning of contextual *ada tongeng* namely, linguistic meanings that are supported by speech situations and events.

**D. Findings**

**1. Semantic Relations**

Alternative meanings with the process as mentioned above, allow different meanings for each party. No matter how different meanings are formed, they remain in one system. Such differences are more accurately thought of as a form of relationship or semantic relations between meanings.

**a. Polysemy**

**1) Equivalent proposition**

This speech event occurred in inter-village public transportation. Usually, passengers ask the driver to stop the car when they almost arrive at their destination. The sign used to ask the driver to stop the car is in the form of a sentence symbol containing the word *panokkak* 'Drop me off. The full discourse is as follows:

[9] See p. 9.

[10] See Text 1; Page 4.

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**Text 1. Panokkak I**

S.1 \tv *saya juga pernah kenak*
\frt I've also experienced it.

S.2 \tv *kemarin ini saya ke Wonio waktu mau turun saya bilang panokkak ri bolana nanik*
\frt Yesterday I went to Wonio, before getting down I said, drop me off at Nanik's house.

S.3 \tv *dibilang wah dèk wulléi*
\frt He replied, well I can not (strong).

S.4 \tv *turun sendiri kau ndik*
\frt Get down yourself bro!

S.5 \tv *jengkelku deh*
\frt I'm annoyed!

*Panokkak* in (S.2) when parsed into {*pa*(*k*)[11]-}{*nok*}{*kak*}, it means 'drop me off because I can't get down by myself' (Bugis non-Lise) or 'get me down by stopping the car' Bugis Lise). The two words *panokkak* have polysemy because of the different meaning components. The process of determining the semantic relation is as follows:

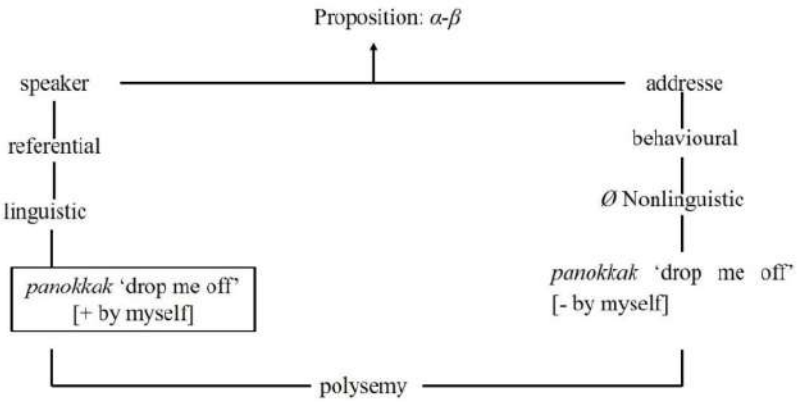


Figure 3 Equivalent proposition of *panokkak*

The schematic above reads as; departing from the same proposition, has a different meaning. Speakers interpret linguistically (referentially) based on Lise's point of view. However, the speaker deliberately responds behaviorally, so that there is a refraction of meaning. The creation of meaning is allowed because the language system provides the tools. The meaning of 'make me *nok*' among Lise people is aimed at something that cannot go down on its own, so it needs to be brought down. The thought triggers a behavioural change in meaning.

[11] Causative. Parallel to the prefix {per-} in Indonesian.

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**2) Non equivalent Proposition**

This incident occurred around the 70s, on public transportation route Lise - Makassar. In the vehicle, there were several of Lis"s people and many others were from other places. Arriving at the destination city, the driver asked the passenger's destination address. One of them said he was going to get down at the port. The passenger's answer was immediately overwritten by other passengers. This dialogue occurs:

**Text 2. Panokkak II**

S.1 \tv makkadakak kénrokik nok idik ohèr[12]
\frt I asked, where did you get down, Sir?

S.2 \tv naakkada akkukappalaké
\frt He answered, in the harbor.

S.3 \tv ko naseng kappalaké matuk panokkak
\frt That's what he said, drop me off later at the port.

S.4 \tv lettuknai koro makkadanai
\frt When they got there someone else said,[13],

\tv idinna nok dèk nirullé makkakkik nok
\frt You go down yourself, can't lift you down.

The results of the analysis of determining the semantic relations of the discourse above are described as follows:

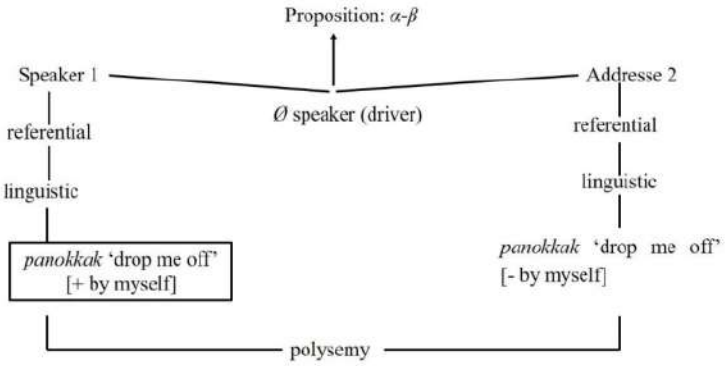


**Figure 4**. Non equivalent Proposition of *panokkak*

A straight line without arrowheads in a semantic relation shows; participants do not understand each other, even though both adhere to the referential way of meaning. In that situation, *panokkak* (S.3) does not need to be done by lifting the speaker1 out of the car. The word *panokkak* does mean bias according to the general sense of the language of the Bugis It is different if speaker1 says *peléppangi* ' {per-}{singgah}{-kan}'.

The way of meaning above does not cause a change in each of the propositions, but the meaning produced by the parties shows a polysemic nature because of the different components

[12] Addressee 1; Lise people
[13] Addressee 2; Other than Lise people.

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of meaning. Speakers[2] imply *panokkak* as 'to get down if it is necessary to lift'. For the speaker, the word is meaningful; to make him go down enough to stop the car according to the intended address. After that, he can go down on his own.

**b. Antonym**

**1) Equivalent Proposition**

This incident occurred when the speaker was going to stay at the house of a village official. The house is always crowded with neighbours to just relax or discuss various problems. On the way, the speaker suddenly exclaimed *maténi uallupai* ..., because he remembered that his glasses were left somewhere. His exclamation disturbed the people, so this *Ada Tongeng* happened:

**Texs 3: Uénngerangi Kacamataku**

S.1 \tv maténai waklupai kacamataku ku bolana pak désa
\frt I'm dead, I forgot my glasses at the village head's house.

S.2 \tv ah dèk taénngerangnaitu
\frt Ah no, you just remember that!!

S.3 \tv ha ha ha
\frt Ha ha ha!

The word … *waklupai (uallupai)* in the sentence (S.1) spoken by the speaker is responded to with … *taénngerangnitu* by the addressee (S.2). According to the speaker, in such a situation it is not true that the speaker calls himself forgetful. The truth is that at that time he remembered that he had left his glasses somewhere. The speaker himself also realized that at that time he remembered, so he could only laugh (S.3). This incident can be explained utilizing the following scheme of meaning:

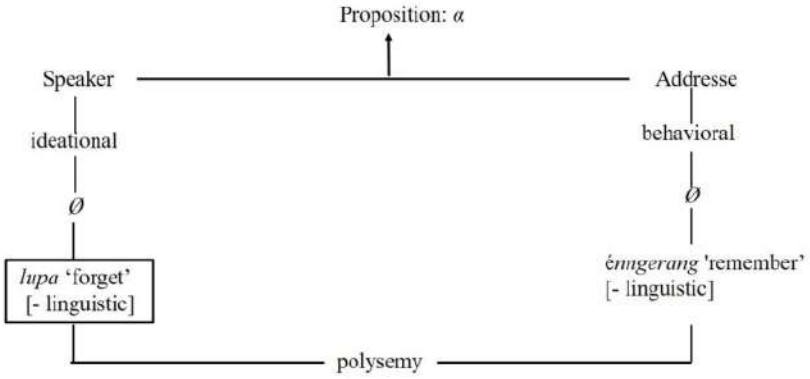


Figure 5. Equivalent Proposition of *lupa* (forget)

The propositions of the two participants indeed are the same, but the speaker interprets the linguistic reality in an ideational way. The word *wak*({u-ak})*lupai*[14] linguistically means 'I don't remember (the object)'. But from a convenient point of view (arbitrary) it means 'remember'. Meanwhile, the speaker's disclaimer is based on a behavioural meaning approach.

[14] i-me-forget-i (accusative)].

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Following reality, it is certain that speakers are not forgetting, inversely proportional to the symbols of the language. The comparison of the words '*lupa*' and '*énngerang*', indeed refers to an anonymous relationship, but in that case, there is no linguistic intervention. The meaning of the word *lupa* is contrasted with *énngerang* because of the way the speaker views reality from a different perspective. Because linguistic devices do not provide facilities for this, an interpretation scheme is formed as seen above.

**2) Non equivalent Proposition**

One day Lise's people wanted to go gardening. His garden has located some distance from his village, in the Soppeng area. On the way, he brought his young horse to carry his things later. Incidentally, at that time in the Soppeng area, a horse raid was being conducted under the leadership of Mr Pétorok. The term *pétorok* was the post of assistant resident[15] in Sulawesi during the Dutch era. A pétorok is in charge of regulating social issues and also has the right to adjudicate cases.

**Text 4. Anyarang Massikola**

S.1 \tv onnak laona makdarek iparéssai anyarangna ku Soppèng
\frt Once upon a time someone went gardening and checked their horses when they arrived in Sopeng

S.2 \tv akko tuang pétorok tuang pétorok Soppeng itikkengirèkèng akkoro
\frt by Mr Pétorok Soppeng, he was firmly arrested.

S.3 \tv magai mutikkengi anyarakku
\frt Why did you catch my horse?

S.4 \tv makkada nasèng na madennik mopa mupakéi
\frt Mr Pétoro replied it's still a small horse you are using!

S.5 \tv jaji najelloki anak sikolaè
\frt Then appointed school children.

S.6 \tv aga palék napugauk iyero makkada nasèng
\frt The horse owner said, then what are they doing!

S.7 \tv Lo ipassikolai iloreng macca tauwé nasabak Balanda makukué
\frt They are sent to school because they are expected to be smart people by the Dutch at this time.

S.8 \tv jaji makkadai ulorettoi macca anyarakku
\frt So he said, I hope my horse is smart too.

The debate between Mr Pétorok and the Lise people arose because of the difference in logic regarding the use of foals as carriers. Lise's people don't understand why their horse was raided (S.3). Mr Pétorok also reminded ... *madennik mopa mupakéi* 'you are still small, you use your horse to work' (S.4). According to traffic rules at that time in Tanah Bugis, it was coded that immature animals should not be employed. While Lise's thinking is not like that. He brought his little horse not to be employed, but to be trained to work. This is how the process of interpretation looks like:

[15] The position of resident was similar to that of regent, but his authority covered several of the regencies known today.

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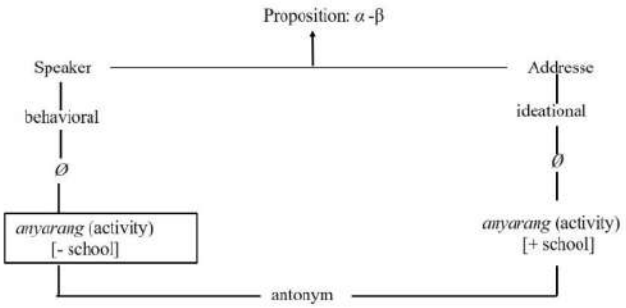


Figure 6. Non equivalent Proposition of *Anyarang Massikola*

Thus, even though they are visually the same, the two participants show differences in understanding that are antonyms. The propositions of each participant in the above scheme are obtained through implicatures. [16] Because the paraphrasing of a symbol with each proposition differs linguistically.

**c. Hyponym**

There are only two forms of hyponym semantic relations. One is in the form of 2 words as the builder of the core meaning of *Ada Tongeng* to which he is attached. Others are in the form of the integrity of the core meaning of the relevant *Ada Tongeng*.

**1) Equivalent Proposition**

This utterance was spoken by an elementary student. He intends to play kites with his friends. Playtime is an exciting time for children. That's how it was that day. More can be seen in this utterance.

**Text 5. Kalajang Iyaréga Panik-Panik**

S.1 \tv perna saya mengantar anak mahasiswa mencari data
\frt I once took a student looking for data.

S.2 \tv wattu kita melewati lapangan ada ananak sedang bermain layang-layang
\frt When we passed the field, there were children playing kites.

S.3 \tv salah satunya mengomel karna layang-layangna tidak mau naik
\frt One of them grumbled because the kite wouldn't fly

S.4 \tv tinggi tapi hanya berputar-putar
\frt high, but only in circles.

S.5 \tv katanya *kalajangsaro* uwèbbu magai *napanik-panik* jajinna
\frt He said: "I think I made a kite, not the propeller!

The people of Lise Village know various types of children's toys. Among them is -- kite -- which requires wind. To equalize the perception of the core meaning of this *ada tongeng*, the analysis process will be described as follows.

[16] A tool for calculating the speaker's intentions that are not reached by linguistic theory about things that are different from the literal meaning or indirect statements of desire.

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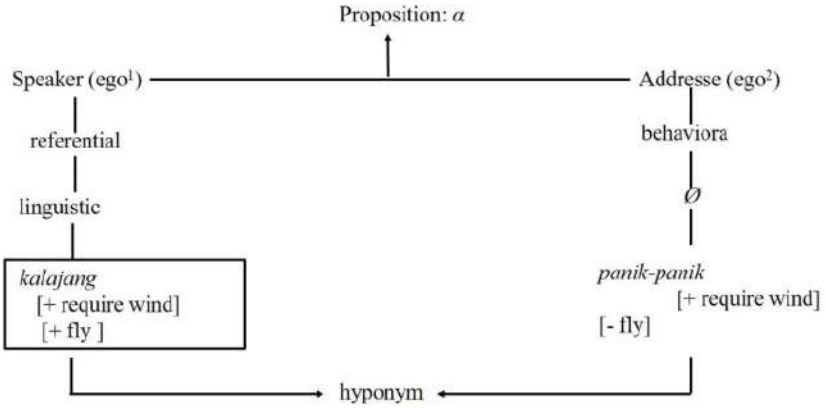


Figure 7. Hyponym of Kalajang Iyaréga Panik-Panik

The schematic above explains that a participant can act as 2 different egos if viewed psychologically. The words *kalajang* and *panik-panik* (S.5) are hyponyms. Because both refer to a group of game tools that require wind to operate. The difference is a result of the gusts of wind. *Kalajang* that is blown by the wind should sly high, while in *panik-panik* just in circles. Therefore, the speaker combines the two words to make sentences to express his thoughts and feelings that the way he made a kite is wrong.

**2) Non equivalent Proposition**

For one reason or another, at that time Mr Pétorok visited Lise on his big motorbike. Discourse events occurred in Lise in the past with Lise's unique theme as well. Exactly when and whose experience is less clear.

**Text. 6. Peddu-Peddunna Tuang Pétorok**

S.1 \tv iyéro engkana tuang pétorok makpeddu-pedduk[17]
\frt Mr. Pétorok came by motorbike.

S.2 \tv makutanai tégai lao tauwé
\frt Then he asked, where is everyone?

S.3 \tv makkada laoi makjalampak[18]
\frt They went to make the *jalampak*.

S.4 \tv jaji lokkani tuang pétorok massappak tau
\frt Therefore, Mr Pétorok immediately went to look for other people.

S.5 \tv na éro nokna tuang pétorok matteruki nasiok jalampak otona
\frt As soon as Mr. Pétorok go down, his motorbike was tied up with *jalampak*.

makkadai tuang pétorok magai musioki motoroké
S.6 \tv Mr Pétorok asked, why did you tie up the motorbike?
\frt
makkadai sekdangkang engkakiktué yasekna

[17] In those days the motorcycle sounded; thump, thump, thump, ... In Java *montor uduk*.
[18] Buffalo leather strap..

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S.7 \tv The person replied while the master was upstairs
\frt
nalari oncoppi ko musalaiwi jaji usioki
\tv it goes very fast, especially if you leave it, so I tied it up.
\frt

Mr Pétorok did not understand why his motorbike was suddenly tied up by Lise person he met, so he asked; *magi musioki motoroké* (S.6). Lise (S.7) implicitly argues, *peddu-pedduk* and *anyarang* are the same types of vehicle. However, *peddu-pedduk* will be more uncontrollable if left alone. Even in a state of being driven or under control, it does not run faster than any other *anyarang* 'horse'. Especially if there is no one in control over it. This opinion seems to be true, but one component of meaning is separated from the speaker's concept, causing a sense of humour. Furthermore, the procedure of meaning can be implied as a scheme below.

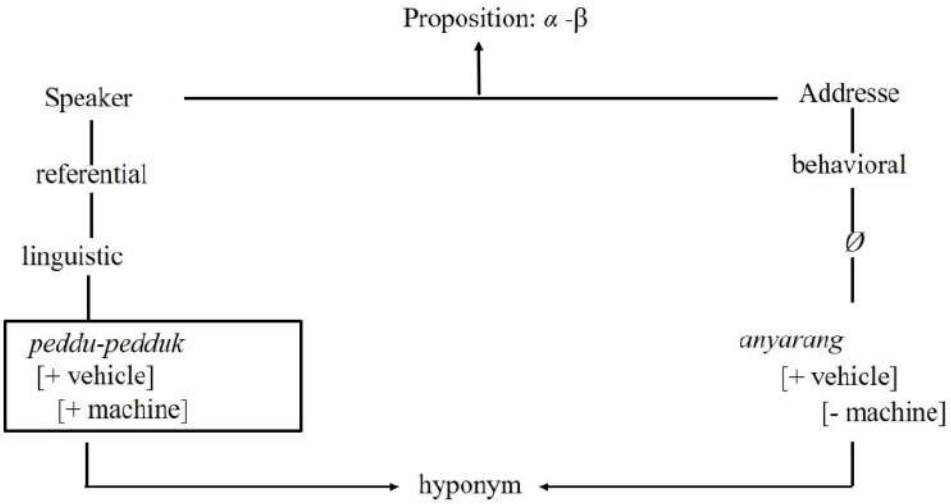


***Figure 8***. Non equivalent Proposition of Peddu-Peddunna Tuang Pétorok

Speakers think referentially, namely, *peddu-pedduk* as engine-powered vehicles, if it is left, do not need to be tied up. While the speaker thinks ideationally [19], namely seeing the relationship between the symbol and its reference occurs indirectly due to mental and personal roles. Speakers analogize *peddu-pedduk* with horses.

**d. Synonym**

This incident occurred in a guava garden, not too far from the people residences. Around Lise Village towards the mountain, there are lots of cashew plantations and cattle roaming around. In general, the orchards in Lise Village are fenced. I don't know which village, at that time a cow entered one of the residents' gardens around Lise Village. Allegedly, the roaming cattle belonged to the residents of Lise Village. Finally, this event happened.

[19] See p. 5.

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**Text 7. Ambok Tini Iyaréga Luppek**

| | | |
|---|---|---|
| S.1 | \tv | iero onnang engka sapinna tamai koro darek jampué |
| | \frt | Once there was a cow in the guava garden. |
| S.2 | \tv | jaji ié matoro luppek |
| | \frt | This is also about Luppek. |
| | \tv | makkadai iéro punna dareké wèh niga saping ié |
| S.3 | \frt | the gardener said; wow, whose cow is this? |
| | \tv | makkadai iéro luppe sapinna ambok tini |
| S.4 | \frt | Luppe replied; Mr Tini's cow! |
| | \tv | naseng onroangni palék sapingé |
| S.5 | \frt | He (the owner of the garden) said, take care of the cow then |
| | \tv | ulommitai ambok tini |
| | \frt | I look for Tini's father. |
| | \tv | naseng akko bolana wak Bombong |
| S.6 | \frt | He (Luppe) answered, look for (there is) him at Bombong's house! |
| | \tv | jaji éro kesik ambok semmang, laoni |
| S.7 | \frt | Poor Semmang's father, he went (to Bombong's house). |
| S.8 | \tv | mannyameng nyawana ié luppek |
| | \frt | Luppe's feelings are relieved |
| S.9 | \tv | nalai sapinna napeddeki lésumiro |
| | \frt | He took the cow away and came home. |
| S.10 | \tv | dek gaga sapingé mélok tikkengi dendai |
| | \frt | No more cows to be caught to be fined. |
| S.11 | | |

The question ... *niga saping ié* (S.3) according to the context should be answered with a pronoun. The nickname *ambok* ... 'father of ...' is uncommon in this context, because it can obscure the reference. If the process of meaning is described, then this is the scheme:

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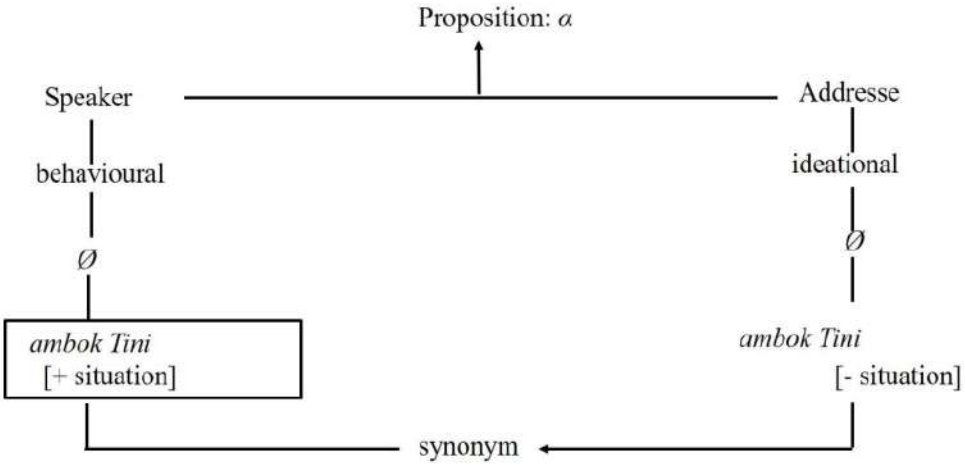


***Figure 9***. Synonym of Ambok Tini Iyaréga Luppek

The schematic above shows that artificial disagreement occurs because the speaker deliberately obscures the meaning. In interpreting a form of speech, it is also necessary to have a sense of the social context and certain situations.[20] For the speaker, *ambok Tini* symbol situationally refers to a certain nature that he does not know. It did not occur to him that *ambok Tini* answer was referring to the speaker, namely Luppek.

Conventionally, the nickname a*mbok* Tini is associated with the speaker who has the eldest child named Tini, then it is the same as 'I' or 'Luppek'. There, the speaker deliberately interpreted *ambok Tini* as 'I'. The meaning is obtained based on the ideational principle by linking the bond of essence to the concept indirectly without paying attention to the coordinates of the interlocutor. The meaning of *ambok Tini*, 'I or Luppek' is essentially symmetrically related, but at any time the meaning can shift according to its distribution.

**e. Homonym**

The poultry farming sector is fairly reliable in Lise Village. One day, Lise Village received a visit from a member of the district level DPR. As usual, the representatives of the people went around seeking input from the residents. Such visits are official, the atmosphere that accompanies them is stiff and confined. During their review, they arrived at a duck farm owned by one of the residents.

**Text 8. Itik Matellok Séddi**

S.1 \tv makutanai anggota dépéèré ku papiara itiké
\frt A member of the DPR asked the duck breeder:

S.2 \tv tassiaga tellokna itikmu
\frt "How many eggs did your duck lay?"

S.3 \tv iyék séddimi pak
\frt "Only one, Sir!"

S.4 magainaengka

[20] See p. 3, paragraph 6.

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\tv "Why so!"
\frt
S.5 pĕkku carana pak, itikku mattellok tasséddi-séddimi
\tv "That's right sir! My ducks only lay one egg after another."
\frt

The essence of *ada tongeng* above lies in the sentence (S.2) ... *tassiaga*.... The morpheme {tak-}{siaga} in the above context can be answered with many eggs that can be produced on the farm or one according to the ability of the ducks to lay eggs. The similarity concerns the similarity of the form of writing and the similarity of sound. Thus, it can be said that in the core there is a related tong, there is a relation of homonymous meaning. The determination of the meaning relation can be summarized in the following framework.

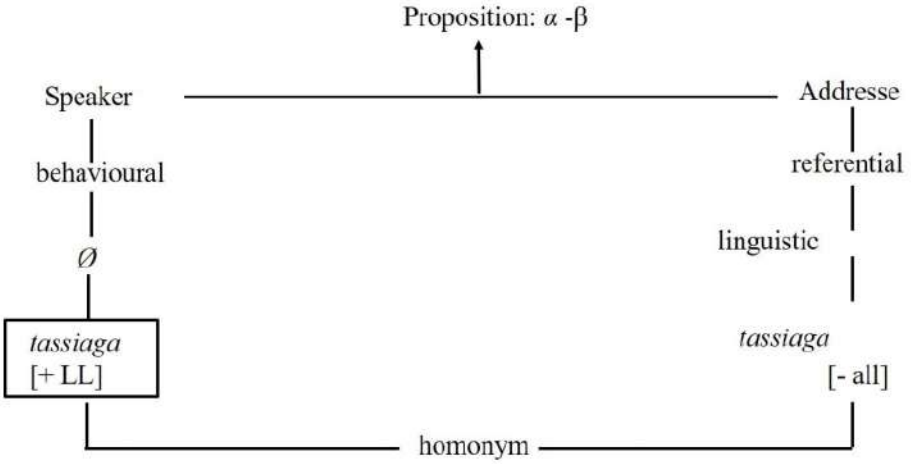


***Figure 10***. Homonym of Itik Matellok Séddi

Speakers use a behavioural approach in questioning something on the farm. The speaker understands the S.1 speech as it is. He interprets the speaker's utterance referentially. As a result, the formal atmosphere melted away, as it was filled with laughter. This is because the meaning of the clause has shifted from its proper meaning. (S.2) according to the context, it should be interpreted as 'how many duck eggs from your farm in a day, not 'how many eggs per duck in a day'. The implicature regarding the meaning of the speaker is obtained from the answer in (S.3) ... *séddimi*..., and is strengthened by the explanation in (S.5). In this regard, the morpheme {*tas*(*k*)-} in (S.5) means 'every or each'.

## E. Conclusion

To Lise's spoken discourse does not only contain a play on words or the accuracy of the meaning of words. However, *Ada tongeng* is understood by the Lise people as a way of expressing the truth in speaking. *Ada tongeng* also shows the Lise people's skill in arranging an aesthetic and humorous form of language. However, it is necessary to build a common understanding of the nature and context of *ada tongeng* so that the inaccuracy of interpretation between speakers and addressees that has occurred so far can be ended. Apart from this, it is also necessary to make efforts to raise awareness to the Lise community that *ada tongeng* they have is not something to be ashamed of. Although *ada tongeng* which is understood as *Lécco-*

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*lécco* ada by the Bugis community outside of the Lise community, *ada tongeng* which is the uniqueness of their linguistic system that needs to be preserved. *Ada tongeng* shows the intellectual property and intelligence of the Lise community in a language that should be proud of.

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# "Attitude towards Online Buying Behaviors of People in Dhaka City in Bangladesh during Covid-19 Pandemic."

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**Abstract:**

*Our daily living style will be almost different from last year. There have been radical changes in our regular life including food habits, travelling, purchasing patterns, sports, and many more. And the reason behind the changes in our lifestyle is the COVID-19 virus. Even the novel coronavirus has still been increasing at the time of writing this article, without any indication of slowing down the infection rate of this virus. As the Virus spreads very fast and people need to avoid physical meetings to be safe from this virus, our daily life has been stuck in lockdown for a long time. The Government of the respective countries has taken action against mass mobilization within their countries along with this individually we are trying to protect ourselves from this virus by maintaining social distancing. Which is affecting our consuming behavior more than before. Which has inspired us to study this subject. When the World Health Organization (WHO) declared the disease as a world pandemic, almost all the countries imposed a lockdown to avoid mass gathering or entry of new people from one area to another. The mass people became much more caring towards themselves and their family members. As a result, people stopped going to the market without much need. Even after maintaining strict health safety measures. Online merchants began delivering daily necessities to their doorsteps under strict security. As a result, it seems that online businesses are gaining popularity. From the general market, customers are leaning towards online shopping. This study will help us to identify whether changes in purchasing behavior have happened or not.*

***Keywords:*** *Covid-19, Pandemic, Online shopping, Customer behavior*

## Introduction:

In the present age, the world has come to a stoppage. From this country to another country is only a matter of moments. When the whole world was running very smoothly. Due to the COVID-19, the World Health Organization (WHO) declared a global pandemic on March 11, 2020. Since then, our lifestyle has been changing. The administration of each country declared a lockdown due to the pandemic. In this pandemic situation and lockdown, the people stockpile the daily necessities. Since the army and police were supervising so that ordinary people could not go out. Not only for the supervising of administration, everyone themselves are trying to maintain social distance by thinking about the health of them and their families. The online businessman picks the right time and takes advantage of this opportunity. They started supplying products ensuring adequate protection and hygiene. They reduce the suffering of a kind of public life. They start delivering products to the customer's doorstep according to the customer's demand in a short

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time. So that customers have become accustomed to online day by day. Ankur Kumar Rastogi (2010) said that online shopping will perform well in future. And we also see that online businesses are now much more acceptable than before. Besides, they are making a good profit now. This has happened, mainly due to the changes in customers' shopping habits during the COVID-19 pandemic.

**Review of literature:**

We now have to adhere to the social distance for this COVID-19 epidemic. On the other hand, when this COVID-19 took on a very horrible form, then we had to differentiate ourselves from the others. It was known as isolation. It is a very familiar word to us that we are social beings and we live together in a society. In this case, Cacioppo & Hawkley, (2009) opined that isolation, sometimes destructive for the human being. That is why due to maintaining social distance and avoiding loneliness we are adopting technology like mobile phones, computers, laptops etc. Nowland, Necka, & Cacioppo (2018) stated that nowadays we are preferring the internet more than our physical communication. The COVID-19 outbreak made changes in our daily life even though we are habituated with those changes. As in the case of business, Tucker (2020 said that many companies went into loss, even closed down. Many companies continued to lose their profits. The main reason for this is that the consumer started their life in the house. The worst affected are travel companies, hotels and travel-related companies (Asmelash & Cooper, 2020). Airline companies have slashed their staff nearly 90%, even the companies' related to travel have no profit in 2020. In the early phases of the COVID-19 Pandemic, one of the most shocking pictures was stored almost empty. Maximum people have stored their daily necessities goods for support during the lockdown. (National Post, 2020; 680 News, 2020). Andrienko, (2020) said in another article that COVID-19 is not affecting all the companies or products are not similarly, few are extraordinarily affected and few are not. When all the businesses are affected by COVID-19 the Jones (2020) expects that in the year 2023 the overall sales will be increased to 6.5 trillion USD. COVID-19 changes our lifestyle, Abiad, Arao, & Dagli, (2020) also say that due to covid-19 our daily routine has been changed. Before this pandemic, we were habituated to do shopping from the supermarket, mall, various types of market places. But nowadays we are more likely to purchase online means e-commerce. In Bangladesh, the e-commerce market is booming and its participation in it has so far been very promising. Online shopping and automated transfers have been properly realized, which further stretches the limits of our playing fields (the daily star, 2020). Moreover, sellers in e-commerce are facing numerous problems, along with excessive shipment, mobility management difficulties, social isolation and lockdown (Hasanat et al., 2020). But the e-Commerce companies are almost overcoming the problems and providing the proper support to their customers. In this year the top ten e-commerce sites in Bangladesh are Daraz, Foodpanda, Evaly, Rokomari, Chaldal, BDShop, Ajkerdeal, PriyoShop. (offer-bd.com, 2021). They are taking orders from the consumers and delivering the products to their customers.

**Methodology:**

The study aims to know the current purchasing pattern of the young people of Dhaka city during this pandemic situation. That is why we are conducting exploratory research among the young people of Dhaka city.

**Sample Design:**

The sample will be a saturation method. And the data of this survey will be collected by google forms.

**Objectives of the study:**

1. To identify the factors which are affecting consumers buying behavior during the pandemic.
2. To identify the challenges of the customers because of this pandemic.
3. To identify the changes in customers purchasing behavior during the pandemic.
4. To examine the expectations of customers from online shopping support after the pandemic.

**Research Design**

**Scope of the study:**

Writers of this article are interested to know, any changes in the purchasing behavior have happened or not. Another goal of this review has been to learn about the different elements that determine the impact on consumers' purchase decisions. This study will help to identify whether there has been any change in online shopping in Dhaka City during the Corona period. If so, how much has changed?

**Limitations of the study:**

1. Since this pandemic has been going on for the last year, there are not enough articles about the customer's purchasing behavior in this epidemic.
2. Due to the Corona epidemic, the authors could not go directly to the respondents. Data had to be collected through telephone and Google forms.
3. This large-scale research requires a large amount of money.

**Source of Data:**

For conducting this study, we have to use both primary and secondary data.

**Primary Data:**

Primary data has been collected through google forms, telephonic conversation and personal observation and discussion with the young people of Dhaka city of Bangladesh**.**

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**Secondary Data:**

News from the daily newspaper, articles related to the purchasing behavior during pandemic (COVID-19), government publications etc.

**Analysis and interpretation**

First of all, one of the things that will help us is the age factor. By this data, we may find out the internet using patterns along with online shopping habits.

| Age | Percentage |
|---|---|
| 15-20 | 31.9% |
| 21-25 | 50.86% |
| 26-30 | 8.62% |
| 31-35 | 5.17% |
| 36-40 | 1.72% |
| 41-45 | 0.86% |

**Table 01:** Age

From table 01, it is clear to us that 50.86% of people are from the age level 21-25. So, the highest internet users are from this age level. And the second-highest of the internet users is between 15-20 years and the number of percentages is 31.9. The percentage of the age level 26-30 is 8.62 and 31-35 is 5.17%. Where the lowest internet user level is .86% for 51 to 45 years among the respondents.

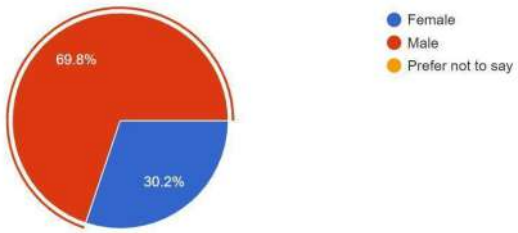


**Figure 01:** Gender

Among the total respondents, 69.8% were male users and 30.2% were female users. So, the internet usage rate is higher among male users. On the other hand, Female users are not much less.

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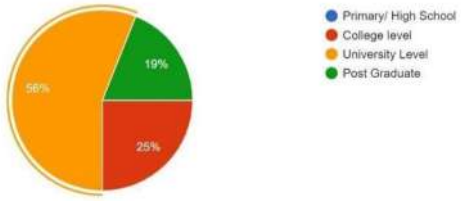


**Figure 02:** Academic Level

It is very much visible to us on this figure 02 is, the highest number of internet users and the online market is formed University level and the second-highest is from the college level. But we did not get any respondents from primary or high school. And the third highest market is from the postgraduate level.

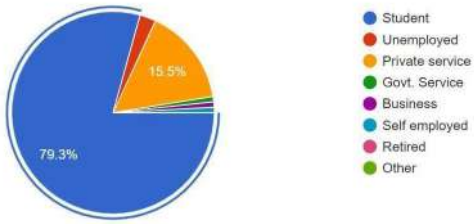


**Figure 03:** Occupation

Among the respondents the highest level of the respondents is students. And the percentage is 79.1% and the second-highest in private service and the percentage is 15.5%. So here is the huge gap between the first and second highest. And the contribution in online shopping from the other occupations are very few.

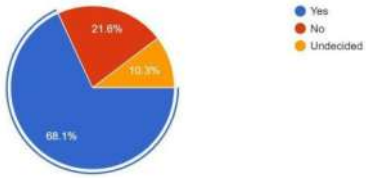


**Figure 04:** Comfortability with online shopping

Among the respondents, 68.1% are comfortable with online shopping, whereas 21.6% are not comfortable with online shopping. And from the rest, they have not yet decided whether they are comfortable or not with online shopping and their rate is 10.3%.

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**Figure 05:** Preferable shopping style

From the chart above, we found that 55.2% of respondents are preferring online shopping rather than physical shopping. So, 44.8% of respondents are preferring physical shopping.

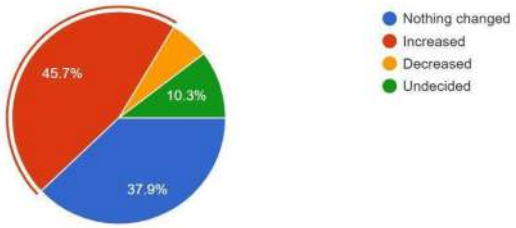


**Figure 06:** Shopping behavior during COVID19 pandemic

It turns out that online shopping has increased in Dhaka city by about 45.7% during this pandemic period. On the other hand, 37.9% of people are saying that they are unchanged, but they may do online shopping in future. Where else 10.3% of respondents are still undecided and at a hesitant level, that is they will buy or not from online.

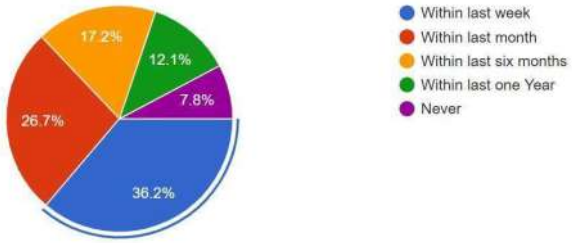


**Figure 07:** Recently bought from online shopping.

When we tried to identify the buying behavior of the respondents about their online shopping. We got the result that 36.2% of respondents have bought the product within this last week. Where else 26.7% of respondents are ensuring that they bought the products from online

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shopping in the last month. Only 7.8% of respondents are responding that they never bought from online shopping. Here it is very much visible that maximum respondents are habituated with online shopping and frequently they are buying online.

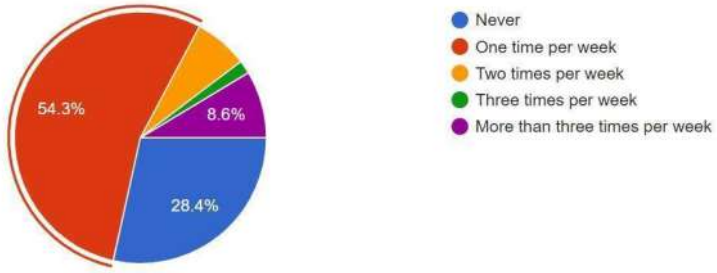


**Figure 08:** Average online shopping frequency during last year

By this answer, we tried to identify the buying frequency of the respondent on the weekly basis and here we found that 54.3% of respondents buy a minimum once a week. Where else 28.4% of respondents are saying that they are buying from an online shop but not frequently in a week. On the other hand, 8.6% are saying that they are frequently buying the product from online shopping even though the frequency is a minimum of three times a week. The rest of the respondents are somehow buying from online shopping.

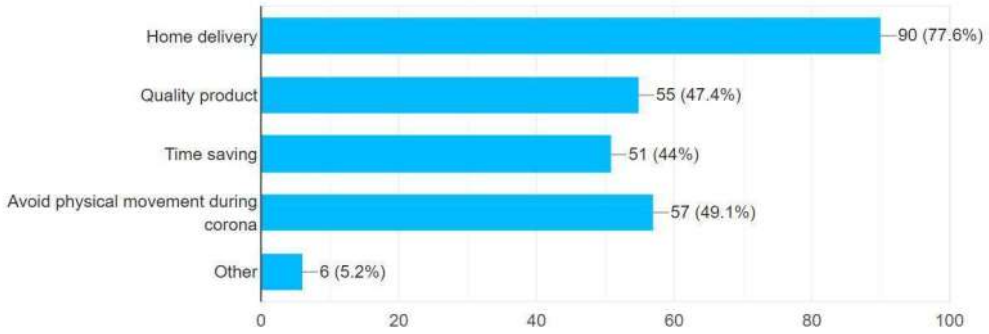


**Figure 09:** Aspect of online shopping

In figure 09 we found that 77.6% of people are shopping online because of the home delivery services from the seller to the customers. And during Covid-19 it is helpful for the customers that they no need to go to market physically. In this case, 49.1% of respondents are mentioning that they are doing online shopping because of avoiding physical movement. 47.4% of respondents are mentioning that they shop online because of getting quality products. A large

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number of respondents (44%) are buying products from online shopping because of saving time. And the rest of them have other reasons to buy from online shopping.

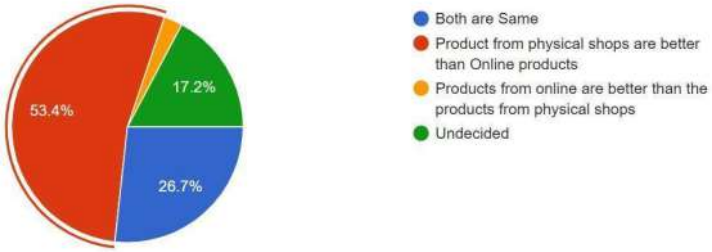


**Figure 10:** Significant difference between the products purchased online and shop

Here in this chart, we may see that 53.4% of respondents are saying that products from the shops are better than online shopping. Where 26.7% of the respondents are saying that both the product from physical shopping and online shopping are the same. On the other hand, 17.2% of respondents are doing shopping from both platforms but they are yet undecided to say anything about the differentiation of the product from online shopping and physical shopping. Only 2.7% of respondents agree that products online are better than physical shopping.

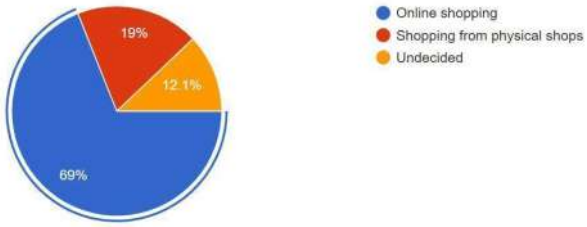


**Figure 11:** Personal priority during the ongoing pandemic

In figure 11 we are seeing that the maximum number of respondents are willing to do online shopping rather than physical shopping. 69% of respondents are agreeing to do online shopping whereas 19% of respondents are saying that they agree to do physical shopping. On the other hand, 12.1% of respondents are yet undecided about online and physical shopping.

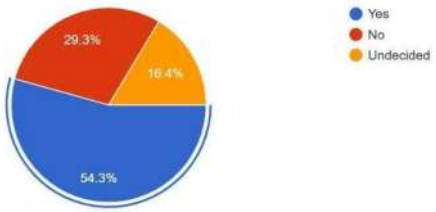


**Figure 12:** Satisfaction with online shopping

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A positive sign is shown in figure 12, here 54.3% of respondents are satisfied with online shopping and on the other hand, 29.3% of respondents are not satisfied with online shopping. Where else 16.4% of respondents are yet in the neutral position to say that they are preferring or satisfying with online shopping or not.

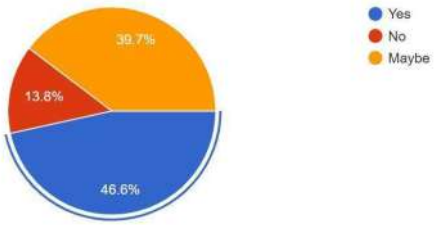


**Figure 13:** Are they delivering products according to order?

Here, in figure 13 46.6% of respondents mean the majority of the respondents agree that online shops deliver the product according to the order. 13.8% of respondents do not agree with this statement that online shops are providing the product according to order. And here 39.7% of respondents are neutral in this case.

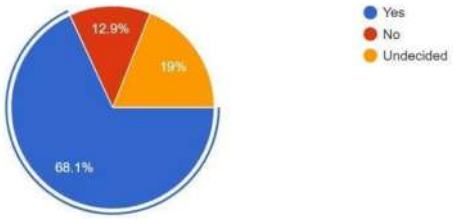


**Figure 14:** Do you think you will return to direct shopping after the pandemic?

Finally, in figure 14, 68.1% of respondents said that they will return to the physical market after the COVID-19 pandemic period. Where 12.9% of respondents are fixed in online shopping and will not go back to the physical market (as per their answer). Where 19% will continue both the online and physical market or yet they are not decided about their opinion.

**Findings:**

1. Most of the internet users are male but female users are not less.
2. Maximum users are graduate and post-graduate in their academic qualifications.
3. Students are more engaged than other professionals.
4. Preference for online shopping is almost similar to physical shopping during the COVID-19 pandemic.
5. Most of the users are doing online shopping because of avoiding physical movement, time savings, and home delivery.

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6. They are still confused about the product quality via online shopping because of delivering different products rather than the ordered product.
7. Still, more than 50% of respondents are preferring online shopping during this pandemic.

**Recommendations:**

1. Online shops need to ensure similar products according to the order of the customers.
2. They need to ensure the quality of the products and services.
3. They need to give priority to the time of the customers.
4. Health protection must be ensured during this pandemic and post-pandemic situation as well.

**Scope for the further research**

1. After this pandemic, the customers are engaged with online shopping or not.
2. Online shops are providing quality products or not
3. Online shops are ensuring to deliver the product according to the ordered product or not.

**Conclusions**

Social distancing is the main way to stop the massive spread of the COVID 19 virus. Since we need to shop for daily necessities, it is difficult to maintain this social distance in physical shopping. But many of our respondents think it is possible to maintain social distance by doing online shopping. Because online soaps are delivering products to people's doorsteps in compliance with healthy rules and regulations. Besides, time-saving, availability and quality products are also there. Due to which the interest of the people of Dhaka city in online shopping has increased to a great extent. Once this epidemic is over, the importance of online markets can be sustained. Here are some things to keep in mind when it comes to post-epidemic markets. Utilizing new advanced and creative thinking including timely product delivery, quality product delivery.

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# Perspectives of Members of a State Organization for Gifted and Talented Education in a Western State toward the Identification of Twice-Exceptional Students

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**Abstract**

*Twice-exceptionality is the phenomenon of a student who presents both a disability and gifted/talented characteristics. One of the most challenging aspects of this phenomenon is how a disability can mask or hide gifted/talented characteristics; how gifted/talented characteristics might mask a disability; or how both might mask each other. Given the paradoxical nature of twice-exceptionality, it is understandable how twice-exceptional students can easily be overlooked in the demanding day-to-day reality of school, even if teachers have knowledge of twice-exceptionality. The purpose of this study was to examine if teachers, parents, and other professionals could identify twice-exceptionality given specific clues. For this pilot study, the author surveyed professionals in the field of gifted/talented to measure their ability to recognize twice-exceptional characteristics after reading fictional scenarios that represented possible real-life situations. All participants were members of the Colorado Association of Gifted and Talented (CAGT) in Colorado USA. A total of 107 respondents responded to an electronic survey with the highest response rate for any one question of 78. The results indicated that professionals failed to recognize twice-exceptionality because of how well the characteristics were masked. The findings indicated that more needs to be done to inform educators of the phenomenon of twice-exceptionality.*

*Keywords: gifted education, gifted/talented, special education, students with disabilities, twice-exceptionality.*

## Introduction

Much has been written about students with disabilities (Gallagher, 1994, Bailey & Rose, 2011) and students who are gifted and talented (Al-Hroub, 2013, Beckley, 1998, Baum, 1990, Brody and Mills, 1997). However, it has only been in the past thirty years that educators and researchers have identified and studied students who are twice-exceptional – those students with both disability and giftedness (Baldwin, Omdal, & Pereles, 2015). Probably the most notable reason it has taken so long to identify and define twice-exceptionality is because of the masking effect each exceptionality has on the other (Baum, 1990; Bianco, 2005; Dare, & Nowicki, 2015; McCallum, Bell, Coles, Miller, Hopkins, & Hilton-Prillhart, 2013). This masking effect makes it difficult even for trained educators to identify twice-exceptional students. It may also be in a large part responsible for why so many twice-exceptional students do not get the services they need to excel in school. It is possible that many thousands of children manage to get through school with below average grades when they might have excelled if their twice-exceptionality had been identified and they had been given the

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opportunity to take part in programming designed specifically for their special needs. Low-incidence disabilities and giftedness have not received much attention from researchers, mainly because they don't occur often (Bailey & Rose, 2011). Learning disabilities (LDs) are considered high-incidence disabilities and are often difficult to recognize. When co-occurring with giftedness, the masking effect is usually even more pronounced and more difficult to identity. For the purpose of this study, LDs and giftedness co-occurring as twice-exceptionality are discussed mainly because LDs and giftedness have been studied separately more often than together. The purpose of this article was to explore the history, characteristics, and definitions of twice-exceptionality and to report on the findings of a pilot survey designed that tested participants ability to identify twice-exceptional students.

**History**

By the mid-19th and early 20th centuries, with advances in medical and psychological theories and understanding of human development, tragic conditions concerning people with any form of exceptionality began to change (National Association for Gifted Children, 2013). When educating children became more standardized, more concern was developed for how to educate and support children with disabilities and who were gifted and talented. When Terman (cited in Orange, 1977) revised the Stanford-Binet Intelligences Scales in the early 20th century in an effort to study the phenomenon of genius, he hoped that IQ scores would be able to predict adult success, though it could not do that to the degree he had hoped (Becker, 2003; Orange, 1977). Gifted and talented children in general education classes rarely received separate or specialized programming in the school system. For children with disabilities, educational opportunities were only available at specialized institutions (Oakes, Wells, Jones, & Datnow, 2012).

The United States congress passed Public Law 94-142, the Education for All Handicapped Children Act in 1975. The act was later reauthorized, and the name changed to Public Law 101-476 and became known as the Individuals with Disabilities Act (IDEA) (Hardman & Dawson, 2008). IDEA included several mandates allowing all students with disabilities to attend public school, including the right to a free, appropriate public education (FAPE). There was nothing originally in IDEA related to students who were gifted/talented. That was left up to the individual states. However, when students are both gifted/talented and present one or more disabilities, they must be considered using the regulations of IDEA because of the disability, not the giftedness (Yell, 2012). In order to provide appropriate educational opportunity for twice-exceptional students, which are students with one or more disabilities and who are gifted/talented, individual states need to have processes in place to provide for both types of special education. Gallagher (1994) clarified that because it was difficult to identify and define twice-exceptionality, many students were being overlooked within the education system. Willard-Holt, Weber, Morrison, and Horgan (2013) provided research that indicates twice-exceptional students continue to be left out due to the difficulties with identification. The purpose of this study was to examine where the difficulty was found in identifying the characteristics of twice-exceptionality in order to provide more information on how to create the professional development and curriculum for the educators who will be working with twice-exceptional students in general education classrooms.

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**Exceptionalities Defined**

Twice-exceptionality refers to students who present as gifted and/or talented and have an identifiable disability, which is often a learning disability (LD or a specific learning disability (SLD). It is necessary to define disabilities, especially LDs and SLDs, as well as provide definitions for gifted/talented. Even with definitions in place, being able to identify twice-exceptionality continues to be challenging.

**Gifted/Talented**

Gallagher (1994) suggested that gifted/talented students should be defined as students with special needs, in much the same way as students with learning disabilities are defined. Bailey and Rose (2011) were more specific in using "intelligence, achievement, and potential" as necessary parts of the definition, as well as "achievement in a field that is rare and particularly outstanding" (p. 2). Bianco (2005) also referred to the potential abilities of students and suggested that gifted/talented students required special education programs. Researchers have gone beyond defining giftedness by high IQ ratings (Heller & Feldhusen, 1986). There are still many definitions of gifted/talented. When the United States began mandating free, appropriate education for students with disabilities, rules and regulations covering special programs for gifted/talented students were rare. It has been left up to individual states to define giftedness and to determine if they would require services or not.

Colorado is one state that does offer rules to provide special education for gifted/talented students through the Exceptional Children's Educational Act (ECEA Rules, 1 CCR 301-8, 2220-R-1.00, et seq., 2013, Sections 2220-R-12.00, 12.01 through 12.08 (2)(e)(v)) and defines giftedness. Colorado has chosen to exceed federal requirements by establishing rules for special educational programs for early childhood education. There is also a separate statute that refers to twice-exceptionality (ECEA Rules, 1 CCR 301-8, 2220-R-1.00, et seq., 2013, §12.01 (12).

**Learning Disabilities**

Physical disabilities are often visible and noticeable, such as hearing and vision impairment, or mobility disability. However, learning disabilities are often invisible, but no less disabling (Bailey & Rose, 2011). The National Joint Committee for Learning Disabilities (NJCLD) worked to create a more thorough definition of learning disability than the 1975 federal definition. This 1981 definition states:

> Learning disabilities is a generic term that refers to a heterogeneous group of disorders . . . .Even though a learning disability may occur concomitantly with other handicapping conditions . . . or environmental influences . . . it is not the direct result of those conditions or influences. (Hammill, Leigh, McNutt, & Larsen, 1988, p. 109).

A learning disability does not always occur alone, but may be hidden by other disabilities, and at times an LD or SLD may be mistaken for behavioral problems. This adds to the confusion faced by educators (Hammill, et al., 1988). There are also times when the LD is masked by giftedness or giftedness is masked by the LD (Baum, 1990), which makes identifying twice-exceptionality much more difficult.

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**Twice-exceptional**

One of the most unidentified, and therefore underserved, student populations today is the group of students who have are gifted/talented and have a disability: twice-exceptional students (Baldwin, Omdal, & Pereles, 2015). There are three main reasons twice-exceptionality is difficult to identify. The first is that a learning disability that is recognized may hide any potential giftedness. On the other hand, giftedness or talent in a student may allow a student to overcome many of the challenges of a learning disability, which would then mask the disability. Finally, the disability and the giftedness mask each other, with each cancelling out the effect of the other, which often allows a student to present as simply being an average student (Bailey & Rose, 2011). This is the masking effect noted by Baum (1990) and Bianco (2005). Beckley (1998) noted that all too often twice-exceptional students who do not have typical learning styles, often are classified as problem students who aren't learning up to their potential. Bianco and Leech (2010) warned that when educators rely on the disability labeling, it is much more difficult to believe that any student with a disability might also be gifted. Zirkel (2004) suggested that when students are referred for special education programming because of a disability, any giftedness that presents itself is often considered as a chance or accidental occurrence. It is also much less likely that once a student is in a special education program for disability needs, that she will then be referred for special education for giftedness (Beckley, 1998). Throughout these challenges of identifying twice-exceptionality has been a lack of a complete definition. The most recent definitions came from the *National Twice-Exceptional Community of Practice*, which stated:

> Twice-exceptional (2e) individuals evidence exceptional ability and disability, which results in a unique set of circumstances. Their exceptional ability may dominate, hiding their disability; their disability may dominate, hiding their exceptional ability; each may mask the other so that neither is recognized or addressed.
>
> 2e students, who may perform below, at, or above grade level, require the following:
>
> •Specialized methods of identification that consider the possible interaction of the exceptionalities
>
> •Enriched/advanced educational opportunities that develop the child's interests, gifts and talents while also meeting the child's learning needs
>
> •Simultaneous supports that ensure the child's academic success and social-emotional well-being, such as accommodations, therapeutic interventions, and specialized instruction.
>
> Working successfully with this unique population requires specialized academic training and ongoing professional development. (in Baldwin, Omdal, & Pereles, 2015, p. 3).

**Purpose of the Study**

The purpose of this study was to examine if teachers, parents, and other professionals could identify twice-exceptionality given specific clues. In reality, clues to whether a student is twice-exceptional may not be noticeable because of the masking effect mentioned earlier. Research has been conducted about teachers in the field and some of the problems they experience in identifying exceptional students within the general education classroom setting.

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Researchers have suggested that more might be done to prepare teachers to be better able to identify twice-exceptionality before they go into the classroom (Baum, 1990, Bianco, 2005). More research needs to be done to examine what processes teachers and others use to identify twice-exceptionality, what gaps are evident in the identification process, and how to better inform teacher candidates who are planning on entering general education classrooms to identify twice-exceptionality.

**Research Questions**

RQ1: When presented with three scenarios of three different, distinct, fictional students whose twice-exceptional characteristics are masked, would the respondent be able to identify twice-exceptionality characteristics?

RQ2: Which combination of characteristics were most easily identifiable as being twice-exceptional?

**Methodology**

For this pilot study, the researcher worked closely with the Executive Board of the Colorado Association of Gifted and Talented (CAGT). The CAGT is a state organization for educators of students who are gifted and talented. The organization serves Colorado and the western region of the United States of America with information and resources for all who are involved with gifted/talented students. Membership is open to educators, parents, and other stakeholders.

This mixed-method study used an electronic survey (Survey Monkey) to collect data. A descriptive design was used to allow for rich, thick analysis of the survey results. The final report was shared with the CAGT Executive Board.

**Participants and Setting**

All participants were members of the CAGT who had some knowledge of twice-exceptionality and who agreed to take part in the study. A form of convenience sampling was used as the participants in this survey research since all participants were all members of the same organization. Participants were sent an email asking for their participation. They clicked on an electronic link stating that their participation was entirely voluntary before they were able to begin the survey. As the survey was all online, participants were able to complete the survey in their own surroundings.

Responses to the demographic questions indicate that the participants were not a diverse group. The majority, 75% ranged in age between 35 – 55 and 89% were female. Most of the participants were college graduates, with the majority, 62% holding master's degrees. Participants were asked to self-identify race/ethnicity. Of the 63 who self-identified, 48 (76%) identified as White/Caucasian.

**Procedure**

1. Only members of the organization were invited to participate in this survey. Participants were informed that the survey was voluntary, they could quit taking the survey at any time, and no identifying information was ever made available to the researcher.

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2. The Executive Director of the organization and two other board members reviewed and approved the interview questions (see appendix A) before the link was sent to the Executive Director.
3. The Executive Director personally sent emails to members. The email contained a brief description of the nature of the research, a word of encouragement to participate and a link to the survey site.
4. The survey site (Survey Monkey) recorded all the responses and analyzed the data. All data has been stored in a Survey Monkey, password protected account available only to the researcher.
5. No identifying information was attached to any of the documents or transcripts. No identifying information was made available to the researcher or Survey Monkey at any time.

**Data Collection and Analysis**

The survey site compiled the data and issued a report based on the number of responses for each question. Graphs were also available for the researcher to use. Although questions were rated on the percentage of responses for each question, many questions allowed the participant to select "Other" and submit a written response.

For this pilot study, a 21-question survey was created to determine if participants would be able to identify characteristics of twice-exceptionality (See Appendix A). The survey instrument was reviewed by three experts in the field to assure content reliability. Members of the state gifted and talented organization were chosen to test the survey because they are professionals in the field of gifted and talented, and it was assumed that they would be more able to identify twice-exceptionality. The total number of participants responding was 107, however, not all participants answered all 21 questions. For the analysis, a descriptive approach was used rather than a statistical analysis approach. This descriptive approach includes the individual comments respondents made on the survey for a richer narrative of the respondents' experience with twice-exceptionality.

**Results**

After responding to the demographic questions, participants read three scenarios of fictional students who may or may not be twice-exceptional (Appendix A). Following each scenario, the same two questions were asked: a) Choose one of the following that best describes the student you just read about, for which there are character specific choices, plus "Other"; and b) What resources or support might you recommend for this student?"

The first scenario was of a seventh-grade boy named Joe who was described as aggressive and argumentative but gets good enough grades on tests to keep from failing. His IQ scores were high, but he showed low academic achievement and problematic behavior. At times he would become excited about something that he was interested in and even argue that the teacher was wrong about some detail or other. His teachers and parents were confused and concerned about his behavior. In this scenario, of the 76 responses (see Table 1), almost 95% answered that Joe should be evaluated for identification in special programming. The remaining 5% selected the other choices.

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**Table 1.**

*Responses for scenario one, first question: "Choose one of the following that best describes the student you just read about."*

| Choices | Percentages | # of Responses |
|---|---|---|
| Joe is a typical problem student. | 1.32% | 1 |
| Joe is a troublemaker and because of his delinquency, his chances of succeeding in school are limited. | 1.32% | 1 |
| Joe should be evaluated for identification in special programming. | 94.73% | 72 |
| Joe is simply not working up to his potential. He could do better if he tried. | 2.63% | 2 |
| Total Responses | 100.00% | 76 |

Under the response marked "Other" to which respondents could add comments, two suggested that Joe was twice-exceptional and three suggested that Joe was gifted.

For resources, 85.9% said that Joe should be evaluated for gifted/talented programming, 8.97% said that Joe should be evaluated for special needs programming, 3.85% said that Joe should be referred for counseling, and 1.28% responded that no evaluation was needed (see Table 2.)

**Table 2.**

*Responses for scenario one, second question: "What resources or support might you recommend for this student?"*

| Choices | Percentages | # of Responses |
|---|---|---|
| Evaluated for special needs programming? | 8.97% | 7 |
| Evaluated for gifted and talented programming? | 85.9% | 67 |
| No evaluation needed. | 1.28% | 1 |
| Refer for counseling. | 3.85% | 3 |
| Total Responses | 100.00% | 78 |

The second scenario concerned the fifth grade Becky who was above average on aptitude and achievement tests and regularly got good grades. However, she did not do exceptional work and she was considered a good student with no problems. Becky seemed shy, she rarely participates, was often distracted or seemed to be daydreaming. When asked direct

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questions, she always responded, usually with the correct answer. She never chose leadership roles, spent most of her time alone and reading, and would rather go to the library than attend optional assemblies. She had been diagnosed by a psychologist with an unspecified emotional disorder because of recent displays of hypervigilance and exaggerated startle behavior. In this case, almost 82% of the 76 respondents chose "Becky should be evaluated for identification in special programming." Responses for the other choices were more evenly distributed than in scenario one (see Table 3).

**Table 3.**

*Responses for scenario two, question one: "Choose one of the following that best describes the student you just read about."*

| Choices | Percentages | # of Responses |
|---|---|---|
| Becky is a typical shy student. | 5.63% | 4 |
| Becky is an average student who could do better if she can come out of her "shell". | 4.23% | 3 |
| Becky only needs a little more encouragement in the classroom. | 8.45% | 6 |
| Becky should be evaluated for identification in special programming. | 81.69% | 58 |
| Total Responses | 100% | 71 |

When responding to "Other", no respondents specified twice-exceptionality, however, one respondent suggested evaluation for both special needs and g/t. Four others responded that Becky should "also" be evaluated for g/t, should already have been evaluated for g/t, or g/t programming should also be included, suggesting that the respondents may have accepted the disability label, but would also evaluate for possible giftedness.

In recommending resources or support, a full 67.14% responded "evaluate for gifted and talented programming" and 24.28% responded that Becky should be referred for counseling. The other two choices were evenly split with 4.29% each (see Table 4).

**Table 4.**

*Responses for scenario two, second question: "What resources or support might you recommend for this student?"*

| Choices | Percentages | # of Responses |
|---|---|---|
| Evaluated for special needs programming? | 4.29% | 3 |
| Evaluated for gifted and talented programming? | 67.14% | 47 |
| No evaluation needed. | 4.29% | 3 |

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| | | |
|---|---|---|
| Refer for counseling. | 24.29% | 17 |
| Total Responses | 100.00% | 70 |

The third scenario was about a fourth grader named Stan who had just below average grades, was an agreeable student, but had some difficulty with reading and language. He did excellent work on projects assigned, but poorly on examinations. He had trouble memorizing spelling and math, but he loved to create things in his woodworking and art classes. Although he got along well with others, he cried easily if teased. There was a discrepancy between his intelligence scores and his school performance overall and Stan was often frustrated in class. The school psychologist had identified Stan as having a non-specific learning disability. There were only 65 responses to this question (see Table 5). Of those 65, 83.08% said Stan should be evaluated for identification in special programming, 13.85% chose that Stan was probably dealing with test anxiety and could learn skills to deal with this. The final two responses were evenly split with 1.54% each.

**Table 5.**

*Responses for scenario three, question one: "Choose one of the following that best describes the student you just read about."*

| Choices | Percentages | # of Responses |
|---|---|---|
| Stan should be evaluated for identification in special programming. | 83.08% | 54 |
| Stan is probably dealing with test anxiety and can learn skills to deal with this. | 13.85% | 9 |
| Stan is a typical fourth grade student. | 1.54% | 1 |
| Stan needs to learn more self-control and how to focus at school. | 1.54% | 1 |
| Total Responses | 100.01 | 65 |

The "Other" comments included three suggestions to evaluate Stan for twice-exceptionality. Fewer respondents answered the question on what resources or support should be offered. Of the 63 responses, 65.08% responded "evaluate for gifted and talented programming", while 26.98% responded "evaluate for special needs programming. Only 3.17% said no evaluation was necessary, and 4.76% responded that Stan should be referred for counseling. Given the responses, this scenario presented characteristics that may be more easily identified as twice-exceptional, as asked by the second research question (see Table 6).

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**Table 6.**

*Responses for scenario three, second question: "What resources or support might you recommend for this student?"*

| Choices | Percentages | # of Responses |
|---|---|---|
| Evaluated for special needs programming? | 26.98% | 17 |
| Evaluated for gifted and talented programming? | 65.08% | 41 |
| No evaluation needed. | 3.17% | 2 |
| Refer for counseling. | 4.76% | 3 |
| Total Responses | 100.00% | 63 |

Interestingly, for some of the participants, the descriptions of the fictional students seemed to resonate with them. This is reflected in some of their comments. For example, for the first scenario, three participants responded:

> "Joe is complicated and needs a team of people supporting his needs and having his back."
>
> "Joe should be evaluated for gifted programming and connected with engaging curriculum and supportive, trained gifted teachers!"
>
> "Joe has a high IQ but may be acting out because it is not properly challenged in school and feels he can't live up to his sisters' accomplishments. May be underachieving to draw attention to self."

From question eight: "Becky has already been diagnosed with an emotional disorder, I would need to know what kind of treatment/alternate plan has been devised for Becky before recommending further evaluation" and "She needs support from her teachers to keep her interest level high and engage the student in discussions and cooperative groups". Finally, from question 10, one participant wrote: "Stan would perhaps benefit from alternate forms of assessment- a paper/pencil assessment is not always going to give you the most adequate or informative information".

The final section of questions concerned participants' familiarity with the concept of twice-exceptionality. Of the 73 participants who answered question twelve, almost 100% responded having knowledge of twice-exceptionality. Of the 74 participants responding to the question of how to define twice-exceptionality, a full 91.9% responded correctly. The majority of 72 participants correctly chose that a twice-exceptional student should be referred to both gifted/talented programming and special needs programming, while 59.7% responded that a twice-exceptional student should also be referred for counseling. Even with the majority of participants stating familiarity with twice-exceptionality, few were able to identify twice-exceptionality when the masking effect was part of the fictional scenarios.

The majority of 70 participants (77.5%) responded that a student with twice-exceptionality would significantly benefit from a gifted/talented program, while the responses were less certain on how a twice-exceptional student would benefit from a special education

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program, where 42.9% responded with "some benefit" and 48.6% responded "significantly". Only 55.7% of 70 participants believe that they were only "somewhat likely" to be able to identify a student who was twice-exceptional. Participants agreed that more research is necessary as 95.7% responded that more research about twice-exceptionality is either somewhat or very important. Finally, most (84.3%) of the 70 participants who responded wanted to learn more about twice-exceptionality.

As noted, the respondents were all professionals who have a connection with the state gifted and talented organization, which explains their knowledge of the characteristics of twice-exceptionality. However, after being presented with scenarios of twice-exceptionality, only 5% said with some certainty that a student might be twice-exceptional and 12.77% said a student should be evaluated for twice-exceptionality. These were the only participants who were able to clearly identify the special characteristics that were present in students who are twice-exceptional. If a teacher identified a student as only gifted/talented, but who also has identified special needs, problems such as underachieving are likely to occur. When one characteristic masks the other, the whole student is not being served. The responses indicated that even for some professionals, it wasn't easy to identify students who are twice-exceptional.

## Discussion

### Findings

This research was examining the masking effect to determine if respondents could easily identify twice-exceptionality. In response to the first research question, there is evidence that respondents were not able to clearly identify twice-exceptional characteristics of fictional students. In response to the second research question, the combination of characteristics demonstrated by the fictional character of Joe were most easily identifiable as being twice-exceptional. Joe was an older student, which might be one of the characteristics that made the discrepancy between his IQ scores and his academic achievement more noticeable. There were no other characteristics specific to twice-exceptionality that were evident in the other two scenarios

Although many of the state organization members who participated in this survey were familiar with gifted/talented and twice-exceptionality, there were relatively low numbers who identified the fictional students as twice-exceptional. The low numbers who correctly identified students as twice-exceptional contradicted that over half of the participants stated that they were at least "somewhat likely" to be able to identify students who are twice-exceptional. This indicates that much more needs to be done to educate professionals and teachers about how the characteristics of students who are twice-exceptional are difficult to perceive. It is through studies such as this one that will help bring about that awareness.

### Limitations

These results are not generalizable to the broader population of educators due to the lack of ethnic diversity of the respondents. The majority of the respondents were female and there was a self-reported familiarity with twice-exceptionality for 100% of the respondents. Also, a power analysis indicates that the sample size is too small to be able to generalize the results.

A limitation may be that with more detailed scenarios, a greater number of participants may have indicated that the scenarios described twice-exceptional students. It should be noted that the respondents were deliberately never given a choice of "twice-exceptional" as a possible response to any question.

**Implications**

This pilot study has demonstrated that professionals working with gifted and talented programs and who were interested in current trends in exceptionality were aware of twice-exceptionality. Moreover, they were able to identify students who might qualify as twice-exceptional and would know how to refer them for appropriate programming. Even though this group of professionals were knowledgeable, most of them agreed that more research needs to be done about twice-exceptionality and that they want to know more about twice-exceptionality. As professionals, many of them offered helpful suggestions on possible improvements to the scenarios and for the questions.

**Recommendations for future research**

Recommendation for future research would include using an experimental design testing the efficacy of using different forms of hypothetical stories for training purposes. Another area of research would be the effect of curriculum designed to teach twice-exceptionality with a focus on teacher preparation. Future researchers may want to compare any differences between using real cases with using hypothetical case studies. Although this current study has added to a growing body of knowledge, it is clear that much more research needs to be done.

**Conclusion**

Even though the participants indicated they had a fairly high level of knowledge regarding twice-exceptionality, the vast majority did not recognize the characteristics of twice-exceptional students when presented in the three scenarios. The scenarios were approved by a panel of four experts in the field as appropriately representing typical case studies. This may indicate that professional development and courses in twice-exceptionality need to include more experience with recognizing characteristics of real or realistic twice-exceptional students. This is a key part of teaching people about twice-exceptionality and points out the need for more tools for the purpose of recognizing, identifying, and serving students with twice-exceptionality.

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## Appendix A

### Survey

The purpose of this survey is to collect data about education and individual understanding of certain student characteristics. This survey has three parts and should take no more than about twenty minutes of your time. Thank you for assisting us by answering the following questions.

**Part 1: Demographics**

1. How old are you?
    a. Under 25
    b. From 25 – 35
    c. From 35 – 45
    d. From 45 – 55
    e. Over 55
2. What is the highest level of education you have completed?
    a. Bachelor degree
    b. Master's degree
    c. Doctoral degree
    d. Other (please explain) _____
3. In which type of locale do you live?
    a. Urban
    b. Suburban
    c. Rural
4. What is your nationality/ethnicity?
    a. I self-identify as: _____
    b. I choose not to self-identify

**Part 2: Scenario and Survey Questions**

Please read one of the following scenarios. After reading the scenario, there will be two questions for you to answer. This process should take about ten minutes to complete.

**Scenario 1:**

Joe is a seventh grader who is often seen as a problem in school. He displays aggressive behavior, is non-compliant, rarely finishes any assignments, is argumentative and frequently challenges his teachers. He gets just good enough grades to keep from failing, usually based on test scores because he often doesn't finish in class work or homework. He shows little interest in most academic subjects, but occasionally show excited interest in one or two subjects. At times he gets so excited, he will interrupt the teacher or even argue that the teacher is wrong. This behavior has increased each year that Joe has been in school. Even though his IQ scores are quite high, his academic work is inferior and his attitudes and behaviors are problematic. Recently he was arrested for breaking items in a local market because he was so excited, he was "out of control" and now is considered a juvenile delinquent, an opinion that seems supported by his school record.

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In non-academic settings, Joe is boisterous and sometimes hyperactive. He often has trouble playing group games such as football, baseball, and basketball, because he is extremely competitive, and also bossy and dominating. He seems to take unnecessary risks and enjoys the degree of tension this poses.

Joe comes from a large family who are in an upper middle class income bracket. He has two older sisters and four younger brothers, and deeply resents the success of his older sisters in school and in the community where they are seen as delightful young ladies who behave appropriately. Both parents attend teacher conferences, and both parents seem confused and disturbed by their son's behaviors and attitudes, which they also observe at home.

Questions about scenario 1:

1. Choose one of the following that best describes the student you just read about.
    a. Joe is a typical problem student.
    b. Joe is a trouble maker and because of his delinquency, his chances of succeeding in school are limited.
    c. Joe should be evaluated for identification in special programming.
    d. Joe is simply not working up to his potential. He could do better if he tried.
    e. Other – please be specific: _____
2. What resources or support might you recommend for this student?
    a. Evaluated for special needs programming?
    b. Evaluated for gifted and talented programming?
    c. No evaluation needed.
    d. Refer for counseling.
    e. Other – be specific: _____

**Scenario 2:**

Becky is a 5$^{th}$ grader in elementary school who scores well above average on aptitude and achievement tests. She gets good grades in all of her classes, and has done so throughout her school years, but does not appear at the very top of her class and does not do exceptional work. Her teachers consistently rate her as a good student who poses no problems in class or to her teachers.

Becky is exceptionally quiet in the school environment, regardless of the setting. In class, she rarely participates in class discussions, but when asked directly, she will respond, and usually with the correct answer. Although she often appears distracted and seems to be in her own world. When the teacher suspects Becky of daydreaming and questions her, Becky is usually able to respond correctly.

She does not interact with other students, and when she is assigned to a small group to work jointly on a project, she does not initiate any action, but will do whatever the group asks her to do. In other settings in the school, recess, lunchtime, and study hall, she remains alone, often reading a book or daydreaming while other children are playing and talking with each other. Whenever there is an optional special occasion, like an assembly, guest speaker, movie, etc., Becky will ask to go to the library instead, where she looks at books, reads, or doodles in her notebook, usually abstract drawings or designs.

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Becky really likes to swing when out on the playground, and will spend much time swinging back and forth when this is available. She engages in no other playground activity, and never actually plays with other children. She is shy and reserved, and two years ago, when teachers became concerned about displays of fear, apprehension, and extreme sensitivity to unexpected sounds or movements in exaggerated startle behavior, she was referred to a psychologist and diagnosed with emotional disord

Becky comes from a middle class family; her father is a local minister and her mother is a stay at home mom but is deeply involved with helping her husband in church work. Becky has four younger brothers, the oldest of whom is only two years younger than Becky and has always been in trouble both at school and at home, showing aggressive and violent behaviors and sudden outbursts of rage and temper tantrums. Usually only the mother comes to teacher conferences, and invariably the mother will refer to Becky as her little helper and then change the subject to the troubles she has with her other children, especially the first son.

Questions about scenario 2:

1. Choose one of the following that best describes the student you just read about.
    a. Becky is a typical shy student.
    b. Becky is an average student who could do better if she can come out of her "shell".
    c. Becky only needs a little more encouragement in the classroom.
    d. Becky should be evaluated for identification in special programming.
    e. Other – please be specific: _____
2. What resources or support might you recommend for this student?
    a. Evaluate for special needs programming.
    b. Evaluate for gifted and talented programming.
    c. No evaluation needed.
    d. Refer for counseling.
    e. Other – be specific: _____

**Scenario 3:**

Stan is a fourth grader in elementary school where he gets average to just below average grades. Although he is a pleasant agreeable child, he has difficulties especially with reading and language. If there are projects associated with a subject or assignment, he does exceptional work, sometimes the best of his entire class, but on academic tests over the subject matter, he does poorly. He has trouble remembering information he is supposed to memorize, such as spelling words and numeric tables such as the multiplication tables, and gets easily frustrated when he in engaged in strictly academic work. However, he takes pleasure and is successful using his hands to create things, and excels in woodworking and art classes. Recently he was awarded first prize in the school poster contest. He is a friendly little boy who gets along well with other children, especially girls, but is sometimes intimidated and teased by other boys because he is not tough and cries easily.

On intelligence scores he tests at above average, but his school performance does not support this level of ability. Sometimes he seems distracted, and often draws on his papers or homework. His drawing ability actually appears to be quite good. He also is easily excited, and shows his emotions readily. He himself does not understand why he has difficulty

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remembering, and becomes visibly upset when he fails or does poorly. When teachers referred him for further assessment, the school psychologist identified him as having some learning disabilities and being easily distracted.

Questions about scenario 3:

1. Choose one of the following that best describes the student you just read about.
    a. Stan should be evaluated for identification in special programming.
    b. Stan is probably dealing with test anxiety and can learn skills to deal with this.
    c. Stan needs to learn more self-control and how to focus at school.
    d. Other – please be specific: _____
2. What resources or support might you recommend for this student?
    f. Evaluate for special needs programming.
    g. Evaluate for gifted and talented programming.
    h. No evaluation needed.
    i. Refer for counseling.
    a. Other – be specific: _____

**Part 3: Knowledge**

Please answer the following questions about your awareness of the topics:

1. Have you ever heard the term of "twice-exceptionality"?
    a. If yes, choose one of the following:
        (1) I'm familiar with twice-exceptional because of my own child.
        (2) I'm familiar with twice-exceptional because I know a child who is twice-exceptional.
        (3) I've studied or have experience with twice-exceptionality.
2. Choose the best statement that defines the term "twice-exceptionality"
    a. A student with two or more learning disabilities.
    b. A student with one or more disabilities who also shows some sign of gifted/talented.
    c. A student who is clearly gifted.
    d. A student with hidden disabilities.
    e. None of the above
3. For what programs should a student who is twice-exceptional be referred? (Choose all that apply.)
    a. Special Education
    b. Gifted/Talented program
    c. Counseling
    d. None of the above
    e. Other, be specific _____
4. Choose one plan you think would work best for students who are twice-exceptional?
    a. Initiating an Independent Educational Plan (IEP)
    b. Initiating a 504 plan
    c. Not initiating a plan

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d. Other, be specific _____

5. In your opinion, are 504 plans
   a. Underutilized
   b. Used just right
   c. Over utilized
6. How well do you think a student with disabilities who demonstrates some gift or talent would benefit from gifted programming?
   a. Not at all
   b. Not much
   c. Some benefit
   d. Significantly
7. How well do you think a student with disabilities who demonstrates some gift or talent would benefit from Special Education?
   a. Not at all
   b. Not much
   c. Some benefit
   d. Significantly
8. How well do you think you would be able to identify a student who is twice-exceptional?
   a. Not at all
   b. Not likely
   c. Not sure
   d. Somewhat likely
   e. Completely
9. How important is it that twice-exceptionality be more fully researched?
   a. Not at all important
   b. Not important
   c. Neutral
   d. Important
   e. Very important
10. How important is it to you to learn more about twice-exceptionality?
    a. Not at all important
    b. Not important
    c. Neutral
    d. Important
    e. Very important

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# The Extent to Which Teachers of Children With Autism Spectrum Disorder Know and Apply Behavior Modification Strategies

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## Abstract

*The aim of the study is to evaluate the extent of knowledge that Jordanian teachers have regarding the use of behavior modification for children with autism. The aim is to highlight how teachers engage in the application of behavior modification strategies and their perceptions regarding the effectiveness of the techniques. The research method adopted in the analysis is qualitative and involves the collection of in-depth data through virtual interviews undertaken through Google Meet. The sample was special education teachers in Jordan working in the education of children with autism spectrum disorder. The data was analyzed using thematic analysis and narrative review of the responses given by the teachers. The main findings are that most teachers are knowledgeable about applied behavior analysis. They perceive the methods positively regarding the applicability and effectiveness of behavior modification techniques. The key implications from the findings include the fact that teachers should be provided with specific training on behavior modification techniques. They should also be provided with support and teaching assistance to address the needs of autistic children.*

***KeyWords:*** *autism spectrum disorder, behavior modification, children, teachers*

## Introduction

Autism Spectrum Disorder (ASD) is one of the most prevalent neurological disorders today affecting 1 in 160 children globally according to the World Health Organization (WHO) in 2020. This has marked a significant increase from the reported prevalence in 2015, which were 4 per 10,000 (World Health Organization, 2019). The rates of ASD across the different countries vary considerably at 1:68 in the United States in 2014 according to the Centers for Disease Control and Prevention (2014). The situation in Jordan is just as dire with over 600,000 children having special learning needs in the country. However, the number of children in Jordan who have ASD is not clear because there are no national statistics on the condition (Centers for Disease Control and Prevention, 2014). The need for inclusive learning in Jordan is a major element of the learning environment that has motivated educators and administrators to identify the learning needs and come up with strategies to ensure that they are able to respond to the needs of this growing population of students. The fact that the students with disabilities have specific needs and there is an increasing need for their rights to be considered and to be given equal opportunities as those without disabilities.

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Students with autism spectrum disorder have unique learning needs due to the difficulties they have with cognitive development, communication and social skills (Sakarneh, Sabayleh & Alramamneh, 2019). Autism is a developmental disorder that involves different deficits and impairments that include difficulty in communication, social interaction impairments, and repetitive behavior and interests (Sakarneh, Sabayleh & Alramamneh, 2019). ASD is an umbrella term referring to 2 disintegrative disorders: Retts and childhood disintegrative disorder and less severe pervasive developmental disorders including Asperger's syndrome (Jordan, 2005). Symptoms of the disorder vary considerably and are heterogeneous ranging from mild delays to severe impairment. ASDs are mostly evident in the early years of life and present significant challenges for a child especially in relation to their behaviors and associated medical conditions (Jordan, 2005). The problems in the health and wellbeing of children with ASD result in educational challenges for the child due to the core challenges and associated symptom including inattention, depression, and sensory dysfunction. These factors mean that children with ASD should be educated in the least restrictive environment, which will ensure that they can effectively learn and the condition does not act as a barrier. Therefore, teachers dealing with these students, on a daily basis, supposed to know and apply behavior modification strategies and techniques. For these reasons, the current study intends to explore the teachers' knowledge and applications of these strategies and techniques.

**Literature Review**

Teachers working with special needs children should have the necessary training to enable them manage the needs of children. The educational needs of children with ASD can be addressed through inclusive classrooms, which have been cited as having the benefits of improving the self-concept of the students, developing positive attitudes, higher acceptance by the other students (Sakarneh, 2020). The needs of learners with autism are not similar across the spectrum of the symptoms of the disorder. It is essential to acknowledge that learners with autism have unique learning need that may be difficult to generalize (Park & Chitiyo, 2011). However, the condition exposes to distinct challenges due to their behavioral issues such as repetitive behavior, their difficulty with social interactions. Learners with autism have difficulty navigating the social world and are at least 20 times more likely to suffer from social exclusion as cited in Pellechia et al (2015).

Learners with autism have fundamental aspects of development that are often challenging for their pedagogical development. These critical aspects of development that are challenging for the learners include social interaction, playing creatively and communicating both verbally and nonverbally. They also have difficulties conveying their personal needs to colleagues and teachers, which also contributes negatively in their behaviors (Maich & Belcher, 2012). Learners with ASD have difficulties sustaining attention in noisy settings or maintaining eye contact and in most cases respond to such difficult environments through negative behaviors such as violence (Sakarneh, Sabayleh & Alramamneh, 2019).

The regular school environment is often busy, loud and crowded making it ineffectively adapted to the needs of learners with autism. This also creates a major barrier to the inclusion of learners with ASD in the regular classrooms (Sakarneh & Al-Swelmyeen 2020). Lindsay et al (2014) also states that the learning environment can invoke negative responses from the students and increase their likelihood of developing stress or anxiety, which further limits

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their learning capabilities. In order to address the associated challenges for learners with autism, teachers have to be knowledgeable about behavior management and the application of behavior modification strategies.

Autism spectrum disorder results in lifelong impairments that have a significant and negative impact on the individuals' learning and social outcomes. These are addressed through early interventions that have the potential to improve the outcomes for the students and increase their capacity to learn (Khaleel, 2019). An inclusive pedagogy can provide the most effective solution to the students since it supports their optimal functionality. However, this issue has not been perceived positively by teacher and parents since inclusive pedagogy has not been effectively defined and formulated to address students with special needs. Some of the strategies adopted in responding to the needs of special students in learning include having school psychologists who work with the regular teachers on areas such as behavior management and emotional support. The parents also need to be involved in these strategies since the outcome of the students can be most effectively addressed through collaboration (Dababneh, 2018).

The perceptions of the teachers and parents regarding behavior management for special needs children can play a major role in influencing its applicability and outcomes. For example, Al-Dababneh (2018) reported that many parents choose not to be involved in the education of their children due to the belief that it does not provide any benefit to them. They also argue that the education and behavior management for the children in school is the responsibility of the teachers and the school. These findings result in a situation where some parents have a hands-off attitude and approach in the learning of their children despite the positive impact it can have on their motivation to learn.

In a study by Khaleel (2019), the knowledge of teachers in using applied behavior analysis for children with ASD was evaluated. The study focused on a sample of teachers from the Kingdom of Saudi Arabia and showed that the teachers perceived applied behavior analysis as a beneficial strategy in their behavior management for ASD children. They found that the main contributing factor was the teachers' level of training and not gender or their experience level. There is a wide range of behavior management strategies that can be applied for ASD students but each student has to be considered individually. Behavior management techniques are applied to analyze the occurrences for the child and help them develop positive behaviors that also reinforce a positive learning environment (Pellecchia, et al., 2015). They are designed to eliminate problem behavior and educate the children on functional alternatives using the principles of behavior change.

In Prasad and Deva (2020), behavior management techniques are applied in the form of behavior therapy and were show to be effective in enabling the child to learn effectively and regulate their maladaptive behavior patterns. As cited in, applied behavior analysis requires the adoption of strategies that increase the desired behaviors through reinforcement and effectively implement strategies to eliminate unwanted behavior such as extinction, punishment, cost of response and overcorrection. Teachers should also be able to handle children by enabling them to build new behavior. Other studies such as Orabi (2007) indicated that most teachers had knowledge of the behavior management strategies just above the minimum level and here were statistically significant differences in their knowledge level depending on gender and training. With such scarcity of this kind of studies, the current study

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comes to fill this gap by adding new knowledge about the extent to which teachers know and apply behavior modification strategies and techniques.

**Study Problem**

Teacher awareness and improving their viewpoints regarding students' disabilities and inclusiveness is a key point for the interventions they can apply effectively in teaching them. The views of the teachers regarding behavior management strategies and ways of including the students are associated with the skills and knowledge they have about them. For example, Jones and colleagues (2001) found that teachers who have negative attitudes regarding the teaching of children with disabilities spend less time including the students in their lessons and teaching processes. Besides the skills and knowledge of the teachers in the application of inclusive learning strategies, parental involvement has also been cited as a major contributing factor. The issue of inclusive education in Jordan is an area of concern for stakeholders in the sector because it contributes to ensuring that their rights are effectively met (Pellecchia, et al., 2015). However, children with autism have many challenges that include behavior problems and difficulties interacting with other students. As a result, training for teachers involves giving them the skills to promote positive behaviors in these students for lifelong success (Al-Swelmyeen, Sakarneh & Al zaben, 2020). The focus of this study is to assess the effectiveness of Jordanian teachers working with ASD children to promote positive behaviors and eliminate maladaptive ones (Grindle et al., 2012). The critical issue is whether the teachers working with ASD children in Jordan have the requisite skills for behavior management techniques and use it effectively.

**Study Questions**

The research questions addressed in the study were:

1. How much do teachers of children with ASD understand behavior modification techniques?
2. How well do Jordanian teachers apply behavior modification techniques for children with ASD in their classes?

**Importance of the Study and Justification**

The relevance of the study is that it provides information that can be beneficial to policy makers for assessing the application and training on behavior modification techniques for children with ASD. The Jordanian government has invested in measures to ensure that the rights of children to education are not ignored due to their disabilities (Higher Council for the Rights of Persons with Disabilities, 2017). By understanding teachers' knowledge of behavior modification techniques in working with ASD children, this study will provide a basis for training of teachers to improve their capacity to promote proactive learning among children with autism (Seitler, 2011). The findings of the study are also beneficial and applicable in showing the areas of weakness for behavior modification in working with children who have autism in Jordan.

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## Methodology

In this study, the researcher uses an exploratory analytical approach to assess the knowledge and awareness of the teachers about the use of behavior modification techniques in classes with ASD children. It assesses the knowledge level of Jordanian teachers regarding behavior modification techniques where the researcher collects in-depth data from the sampled teachers working directly with children who have ASD.

## Participants

The study population for this study was special education teachers in Jordan working with children who have autism spectrum disorder. The focus of the study was on the teachers working in schools in the City of Amman in Jordan due to the proximity to the researcher. The special needs teachers who work in autism spectrum disorder centers in the city of Amman are about 220 who are registered by the government and certified to work with autism spectrum disorder. The sample was selected from this population through self-selection where all registered teachers in the city were contacted and those who responded to the invitation were included in the study. Due to the focus on an exploratory approach and the use of qualitative research strategy, the number of teachers included was small and only 20 were involved in the interviews. The characteristics of the study sample are presented in the table below (Table 1).

Table 1: Characteristics of the Study Sample

| | | Number | Percent |
|---|---|---|---|
| Gender | Male | 7 | 35.0% |
| | Female | 13 | 65.0% |
| Education | Bachelors or above | 8 | 40.0% |
| | Diploma and below | 12 | 60.0% |
| Special education training | Yes | 15 | 75.0% |
| | No | 5 | 25.0% |
| Experience | <5 years | 9 | 45.0% |
| | 5-10 years | 6 | 30.0% |
| | >10 years | 5 | 25.0% |

## Instruments

The study was undertaken as an in-depth assessment of the working environment as well as the knowledge that special needs teachers in Jordan have regarding the use of behavior modification techniques. In order to gather the relevant information from the participants, the study made use of an in-depth interview schedule, which was used in a face to face interview that was conducted using Google Meet and took 30-45 minutes to complete. The research instrument was designed to gather in-depth information from the participants by having follow-up and other questions that were designed to get as much information as possible from the participants regarding the research issue. There was a survey instrument consisting of demographic information as well as the training and educational qualifications of the

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participants. The second part addressed the practices of the teachers in using behavior modification techniques in dealing with children who have autism spectrum disorder.

**Ethical considerations**

The key ethical considerations in the study were the confidentiality and privacy of the participants who were interviewed. The participants were provided with an informed consent form that allowed the researcher to provide all relevant information to the participants to ensure that they understand what is expected from them. The informed consent form is accompanied by an information sheet that was used to ensure that the participants clearly understood what was contained in the interviews.

**Procedure**

The study was undertaken by first sending out the invitations to participate to the teachers registered by the Ministry of Education and the Ministry of Social Development working in the education of children with special needs. The teachers who responded to the invitation were then provided with an information sheet and the informed consent form that was used to ensure that the participant would be able to agree to the conditions of participation. The data was collected using the interview guide that was used to drive the questions asked to the participants. The interviews were undertaken virtually through Google Meet and recorded using an audio recorder for verbatim transcription afterwards.

**Data analysis**

Verbatim transcription of the interviews allowed for thematic analysis of the responses given by the participants. The transcripts were evaluated by an independent expert with experience in qualitative research. The transcripts were subjected to thematic analysis on each individual question that allowed for a clear assessment of the views held by the participants regarding the practices of behavior modification for children with ASD.

**Results**

The thematic analysis was applied on the responses given by the participants to the different questions. The participants provided in-depth information about their experiences working with children who had ASD as well as their views and perceptions regarding the different issues that were relevant to that work. The main complaints reported by the teachers were stubbornness or temper tantrums, stereotypic behaviors, repetitive behavior, and other behavioral problems. The responses provided a common theme of the challenges that the students presented to the teachers in relation to their behaviors. It was essential for the teachers to come up with appropriate behavior modification techniques because failure to apply them makes the children difficult to manage in class. Failure to implement behavior modification for the children was also cited as a major factor that reduced the capacity of the children to learn.

The second question assessed the teachers' views regarding the different approaches available for teachers to respond to behavior problems among students with ASD. A major issue with the findings was that half of the teachers reported having experience and knowledge of more than five behavior modification techniques that they can apply. 10 of the

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20 participants in the study indicated that they were aware of the behavior modification techniques applicable to their students. These included pivotal response training, positive behavioral support, social stories, and positive feedback. Most of the teachers also reported that their knowledge of the behavior management techniques for children are based on the Applied behavior analysis (ABA) approach, which they use for tracking the child's progress in improving their reading, writing and social skills. The ABA approach was found to be the most effectively applied and understood approach to behavior modification among Jordanian teachers working with ASD children.

The issue of training and perceptions about the behavior modification techniques was also considered in the research questions. The responses from the participants indicated that about 40% of the teachers do not have formal training on behavior modification techniques. 75% of the teachers reported having training on special education but it is interesting that not all of them were trained specifically on behavior modification for autistic children. This indicates a relatively low focus on giving the teachers special training that will enable them to address the needs of children who have autism spectrum disorder. On the perceptions regarding the application of the techniques in managing the education of children with ASD, the main themes were that teachers reported that their application of the techniques was significantly influenced by the availability of support from the government. They reported that support for behavior modification in the integrated classrooms was limited and they mostly did not have support staff such as teaching assistants and school psychologists to help in managing the behavior and determining the right therapies to be adopted.

**Discussion**

The views of special needs teachers in Jordan indicate that there is a relatively low level of knowledge in the application of behavior modification techniques. Most of the teachers who are trained in special education do not specifically have knowledge of behavior modification techniques. The teachers involved in this study perceive the behavior modification as being highly positive and effective in responding to the learning needs of the students and ensuring that they can effectively learn despite their disabilities.

The behavior modification techniques are highly applicable in giving the teachers a more manageable teaching environment. ASD is a major challenge for teachers working with ASD students because the children are likely to have maladaptive behaviors that adversely influence their outcomes. Students with ASD require effective approaches for enabling them to address their learning and behavior needs. These issues require the application of behavior modification techniques that can improve their capacity to learn (Prasad & Deva, 2020). The ideas presented by the teachers interviewed in this study indicate that the behavior modification techniques are necessary for improving the learning experiences as well as outcomes. The critical considerations in this respect are that learning for children with ASD can be improved through behavior modification strategies that contribute to their performance. Autistic children have social problems that include tantrums that can negatively contribute to their learning. These findings are similar to those of Sha'arani and Tahar (2017) that highlight the relevance of behavior modification for tantrum management.

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## Conclusions and Implications

In conclusion, the consideration of behavior modification techniques in managing the behaviors of autistic children is an important strategy for addressing their learning needs. The need for inclusive learning in Jordan is cited as being heavily considered as a strategy for improving the outcomes for all students. By having effective behavior modification techniques that are applied in the education of autistic children, it is possible to enhance their outcomes in relation to developing adaptive behaviors and avoiding negative ones. The results of this analysis indicate that children with autism in Jordan do not have many opportunities for effective learning because their teachers have relatively low training and experience on the application of behavior modification techniques. The government should invest in training for their special needs teachers to give them specific skills on behavior modification and how best they can respond to the needs of such children in their classes. The government should also seek to reinforce positive perceptions about the measures and the learning needs of autistic students to ensure that they can positively work with them to improve their outcomes and enhance their social skills including the elimination of maladaptive behaviors.

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# The Usage of Contents Enriched by Augmented Reality Technology in the Instruction of Students with Special Learning Disability

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## Abstract

*The purpose of this study is to examine whether or not the usage of augmented reality technology is effective in instructing the concept of square prism to students with special learning disability and whether the conservation of the taught concept continues after the education is completed. The multiple probe model between subjects with probe phase, one of the single-subject research models whose implementation steps were planned beforehand, was used in the study. The study population consisted of three students with special learning disability enrolled in the fifth grade and the research was conducted in the Düzce province of Turkey during the second semester of the 2018-2019 academic year. In addition, the "Rapid Prototyping Model," which was developed by Tripp and Bichelmeyer (1990) in order to design computer-aided instructional environments, was employed in the creation of learning materials prepared with augmented reality technology for the concept teaching process of the research. Thus, the learning materials assisted by technology were prepared by carrying out the processes of identifying the needs with a rapid synthesis, content analysis, goal determination, prototype creation, prototype usage and maintenance of the system. First, the reactions of the students were recorded upon organizing a starting-level session in the research process. In the following stages, teaching, probe, monitoring, and generalization sessions were also conducted. As a result of the research; it was observed that the augmented reality technology was effective in instructing the concept of square prism to students with special learning disability, the conservation of the concept acquired as a result of the application continued after the education was completed, and the opinions of students and teachers about this technology were found to be positive.*

***Keywords:*** *Augmented reality, Special learning disability, Concept teaching*

## Introduction

The process of learning has an important place in education and students are expected to improve under effective learning environments prepared during this process. However, some of the students cannot display the expected improvements and face problems during the process of learning. These students are defined as "Individuals with Special Learning Disability" in the field of special education as a result of exhibiting certain characteristics. The Turkish Ministry of National Education (Milli Eğitim Bakanlığı, 2008) describes such individuals as those negatively affected by their listening, reading, writing, speaking, focusing, spelling, mathematics, reasoning, motor and organizational skills, as well as

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displaying low achievements in educational environments compared to their intelligence level and to their peers. In general, special learning disability is defined as having significant difficulties in acquiring and using skills in one or more of the academic processes, although the mental capacities of the individuals are normal or above normal for their age, but have no impairment of any of their senses (e.g., vision or hearing) (Pekel, 2010).

Students with special learning disability are considered to be in a group that exhibit inadequacies with high levels of incidence in the field of special education (Çakıroğlu, 2015). Nevertheless, it is observed that students diagnosed with this inadequacy in the field of education are sometimes ignored and sometimes not easily noticed as they do not differ from the students with typical development in terms of their appearance (Korkmazlar, 2016). Moreover, early diagnosis and the provision of educational support environments are often delayed due to insufficient knowledge about this field. In addition, students can often be labeled as "unsuccessful", "careless", "naughty", "irresponsible", or "indifferent" in educational environments. In order to avoid these situations, it is necessary to get to know students with special learning disability, to plan appropriate support processes for their education, and to implement these planned education processes under appropriate conditions. On the other hand, it is seen that students in this group have common aspects that are frequently encountered when their characteristics are first examined. These are expressed as students' low achievement in reading, writing, and math skills compared to their peers, and their cognitive development status, and having problems in the fields of listening, thinking, perception, and self-expression (Özen, 2011). Also, information processing, perception, focus, and attention are among these characteristics (Bender, 2014; Doğan, 2012; Kulaksızoğlu 2016; Polat, 2013). As emphasized by Özbek (2014), "individuals with special learning difficulties due to their cognitive development characteristics may encounter problems of concept development, conceptualization, abstraction and thinking at abstract level, memory retention, problem solving and symbolization" (p. 14). Therefore, activities such as attention, focus, memory, and perception should be implemented for the education of students with special learning disability (Doğan, 2012), and with technology-assisted learning environments prepared accordingly (Polat, 2013). In this way, assistive technologies that enable students with special learning disability to reveal their true potential and overcome their problems can be included in their planned training processes (Polat, 2013). In addition, technologies enrich, maximize, and enhance their learning process. As a result, these students may be prevented from experiencing problems with self-confidence and thereby gain a more positive self-perception, through supportive educational environments that enable them to progress, develop, and to express themselves.

The fast-developing nature of information technologies can significantly affects the learning processes of today's students. Therefore, the learning processes of both students involved in the field of special education as well as students with typical development should be supported by appropriate information technologies, and students' interaction levels with instructional content should be increased. One of the technologies that students of special education can utilize in the educational environment is "Augmented Reality," the potential of which has recently become widespread across many areas and environments. Augmented reality is defined as technology that enables users to see the real world. Augmented reality offers virtual objects superimposed upon or composited with the real world, with three basic

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features; real and virtual combination, real-time interaction, and three-dimensional recording functionality (Azuma, 1997). In addition, this technology offers an environment that enables digital content to be added to and intermixed with our real-world perceptions (Yuen, Yaoyuneyong & Johnson, 2011). In addition, research studies conducted on the usage of augmented reality in education have also emphasized that such technology can help students to gain many features such as the ability to construct knowledge with three-dimensional objects instead of traditional methods (Kaufmann, 2003), the preparation of a research, discovery and design environment (Orhan & Karaman, 2011), and in providing colorful, remarkable, interesting, and interactive learning in the teaching of certain subjects (Pasaréti et al., 2011). In particular, it has been stated that such technology can regulate educational environments by offering a different point of view in terms of presenting situations that otherwise present issues in being actualized, or in the concretization afforded within a real environment under appropriate conditions, as well as the gaining of knowledge and skills using different sense organs through a mix of virtual and physical interactions (Özarslan, 2011). It has also been expressed that augmented reality technology can have a positive influence on students' academic achievements and attitudes towards their course of study (Şahin, 2017).

On the other hand, despite having many uses in education, augmented reality also has certain limitations. Krevelen and Poelman (2010) stated in their research that such technology can be limited by technique, cost, weight, use of force, and non-compliance according to differences in points of view. Therefore, it is necessary to integrate this technology into education and training environments, to develop more applications that help to solve problems such as imaging, and to support additional studies in this area in order to contribute to eliminating or negate the impact of these perceived limitations. As emphasized by Durak and Yılmaz (2019), the educational value of applications enriched with augmented reality technology is not only dependent upon the technological utilization, but also upon the design and implementation, and how it is integrated within the teaching process. Consequently, augmented reality applications, which are created through the combination of many component elements, can be applied with in learning and teaching environments through its adaption to concept instructional processes.

Augmented reality technology engages different sensory organs in the students' process of learning concepts, and also provides a sense of fun and increased motivation through the enhancing of educational environments that attract students' attention to the subjects. Technology containing such features can be employed using different methods such as the designing of an experimental environment, preparing an educational game, modeling, informing, adding to the content of a book, as well as through supporting the educational processes of students with special learning disability. When the published research studies are examined, it can be seen that the use of augmented reality in the field of special education is considered to be important, and it has been emphasized that it can offer three-dimensional educational environments to students. Richard, Billaudeau, Richard, and Gaudin (2007) designed an educational augmented reality application that allows for students with learning disabilities to match plant elements, and observed that the application helped to increase the students' motivation. Lin et al. (20[illegible]) investigated a way to integrate augmented reality technology into educational content for students with disabilities, and developed a mobile

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application that helped to facilitate their learning of geometry. Wang and Hsu (2018) examined the interaction of augmented reality technology with children under 6 years of age diagnosed with attention deficit and hyperactivity disorder, and emphasized that the students were able to understand the appearance and color of animals through the playing of augmented reality games. In the field of special learning disability, Vinumol, Chowdhury, Kambam, and Muralidharan (2013) examined the potential of using augmented reality books in education and teaching, and emphasized that such technology may be of interest to students with learning disability due to their limited attention span. In addition, Colpani and Homem (2015) stated in their study that certain concepts and skills can be taught through gamification using augmented reality technology, whilst Fecich (2014) mentioned that it could be used especially for students with special learning disabilities in the learning of concepts. As emphasized by Kurt (2018), "the concept is the structures and designs that show the common characteristics of the phenomena or objects in the human mind and these designs are shaped and accumulated in the human mind" (p. 7). Considering the definition of a concept, many situations/issues are understood, resolved and used in the learning process through being shaped in the mind. Studies have also shown that contents supported by augmented reality technology can support the concept instruction process of students with special learning disability. In this way, technology-assisted presentation of the concept instruction process can increase student-subject interaction.

Augmented reality can be seen as an auxiliary bridge in the teaching process of concepts in special education, a support system, and a technological approach that has the potential to better enable remembering and information acquisition with content directed at students. In the current study, the aim is to prepare instructional content for the learning of concepts through the utilization of augmented reality technology in an application developed for students diagnosed with special learning disability. Then, the developed content will be applied to the target student group and the results of the application's usage evaluated. Thus, the stages of needs identification through rapid synthesis, content analysis, goals determination, prototype creation, prototype usage, and the establishment and maintenance of the designed system will be carried out. The usage of content enriched with augmented reality technology in the education of students with special learning disabilities will be examined, and evaluated as to whether or not this technology approach has an effect on the students' concept learning, whether the conservation of the concept learned was maintained, and the direction of the students' and teachers' opinions will be analyzed. In this context, the problem statement of the current study is as follows:

To examine the effect of using content enriched with augmented reality technology on the concept learning of students with special learning disability in education.

## Method

The current study aimed to reveal whether or not the use of content enriched with augmented reality technology had an effect on the education of students diagnosed with special learning disability. In parallel with this purpose, the effect of using content enriched with augmented reality technology on concept learning by students with special learning disability and the conservation of the concept during their education was examined. In addition, the opinions of the participant students and teachers were also utilized. During this

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process, multiple probe model between subjects, one of the single-subject research methods, was employed. In terms of the multiple probe model between subjects, there are two types; "probe phase" and "probe trial" (Tekin-İftar, 2012). The probe-phase model, whose exact implementation time during the probe phases needs to be planned prior to the research, was applied in the current study The independent variable of the study is the square prism teaching material assisted by augmented reality technology designed and developed for students with special learning disability, while the concept learning level of the students with special learning disability constitutes the dependent variable of the study.

***Study population***

The study population of the research consists of three fifth-grade students studying in Düzce province, Turkey, who had each been diagnosed with special learning disability according to a "Special Education Evaluation Board Report" issued for each student by the Directorate of Düzce Counselling and Research Centre. The students each possess the prerequisite skills to qualify for the study, which were the ability to follow verbal instructions, understand more than one instruction, have fine motor skills, open applications on tablet computer, and follow instructions, etc.). The students each received the necessary training in line with the needs specified in their education plan, with educational content including supported education in the field of mathematics.

The students' real names were not used, replaced by pseudonyms assigned by the researcher for the purposes of protecting the privacy and anonymity of the participants. In addition, interviews were conducted with both the participant students and their mathematics teachers with the aim of determining whether or not the students met the prerequisite skills to participate in the study. In considering the characteristics of the students as a result of the interviews conducted, the following statements can be made about each of the three participants.

*Mert:* The student is seen as dynamic, talkative, self-confident, and a researcher who shows interest in technology-supported educational environments. However, Mert has been known to make simple mistakes due to attention deficit, and has problems focusing and sequencing, and has been noted as being forgetful. In addition, it was observed that Mert requires supportive education in both literacy and mathematics skills compared to his peers and needs to improve himself.

*Ege:* The student is seen as being dynamic, talkative, self-confident, and shows interest in technological education environments. However, Ege makes simple mistakes due to attention deficit. In addition, it was observed that there was a need for supportive education in both literacy and mathematics skills compared to his peers. As stated by Ege's mathematics teacher, he cannot progress or receive adequate education in mathematics. It is also seen that Ege uses technology more for games, watching movies, and for entertainment purposes.

*Ali:* The student is reportedly dynamic, talkative, interested in and curious about research, and exhibits characteristics that include an eagerness for technology-supported education and loves animation. However, Ali suffers from attention deficit and focus problems. In addition, it is seen that he has the ability to understand what he listens to or reads, can follow verbal instructions, and can follow more than one instruction. On the other hand, it was observed that Ali requires supportive education in literacy and mathematics skills

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compared to his peers and needs to improve himself. Along with these issues, it was determined that Ali likes technology and wants to use it for educational purposes. However, he cannot receive adequate education in the field of information technology due to his current school environment.

***Practitioner***

The practitioner of the research completed the Master's Degree program of Gazi University's Computer Education and Instructional Technology Department. The practitioner is also an Information Technology and Software teacher. All applications covered by the research were carried out by the researcher, and the learning materials developed by the researcher and supported by augmented reality technology were used in this process.

***Observer***

The observation stage of the research was carried out by an expert and the practitioner of the research within the Department of Special Education. At this stage, interobserver reliability and application reliability were also determined.

***Environment***

The working environment was prepared prior to the sessions being held with the students in the research. In the study environment, a table and chair for the students were arranged so that the students could use a tablet computer. Also, the researcher moved to a position where the students could see them easily. These positions were in front of the students during the phase in which the application was introduced, and next to the students during the application stage in order to be able to observe the steps taken by the students in using their tablet computers. In addition, the research environment was arranged in a way that was deemed suitable for the students by ensuring that it was clear of distracting stimuli, and all studies were conducted in this pre-prepared environment.

***Rapid prototyping instructional design model and learning materials***

The Rapid Prototyping Instructional Design Model, as developed by Tripp and Bichelmeyer in 1990, was used in the process of preparing learning materials for students with special learning disability. In line with this design model approach, the learning materials were prepared by carrying out the steps to quickly identify the students' needs, analyzing the content, determining the goals, preparing the teaching plan, creating the prototype, using the prototype, establishing and controlling the developed system, and completing the instructional design process.

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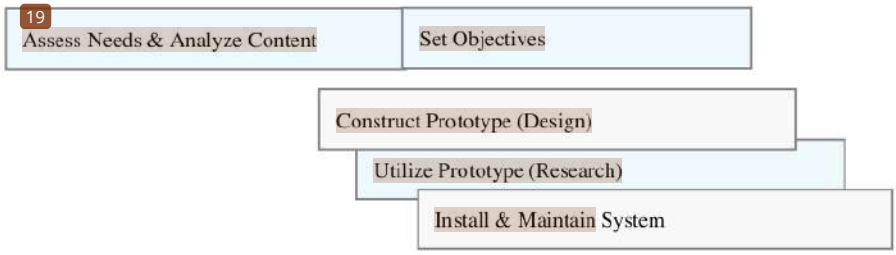


*Figure 1*. Rapid prototyping instructional design model (Tripp & Bichelmeyer, 1990).

The augmented reality-assisted learning materials designed in line with the model depicted in Figure 1 were developed within the Unity 2017.3.0p3 program. The Unity program offers a platform that enables the creation of two-dimensional and three-dimensional environments. In the study, educational contents and materials that enable concept teaching were designed in 3D with the use of the Unity program. In addition, Vuforia SDK, which can be used with the Unity program and offers the software package, was utilized in order to realize the augmented reality application. Thus, these two components were combined and a pre-trial learning material was prepared and a square prism learning material to be used in the application phase was prepared prior to commencing the application.

Opinions about the designed learning materials were received from a total of six experts, three of whom were specialists in Computer Education and Instructional Technology with doctoral degrees in the discipline and three were specialists in the field of Special Education (one having completed a doctoral study, and two being Research Assistants). Furthermore, an expert who completed a doctorate in Mathematics Education was interviewed regarding the scope of the content and the question structures. In addition to these, three teachers including two Mathematics and one Special Education teacher were asked to evaluate the learning materials in terms of their suitability to the students' academic level and for the intended purposes of the current study.

Later, when the learning materials supported by augmented reality were available for the implementation phase, two experts with a doctorate in Computer Education and Instructional Technology and with experience conducting research in the field of instructional technology also provided support. These experts reviewed the learning materials' development according to Yalın's (2010) material evaluation form as "good," "medium," and "bad."

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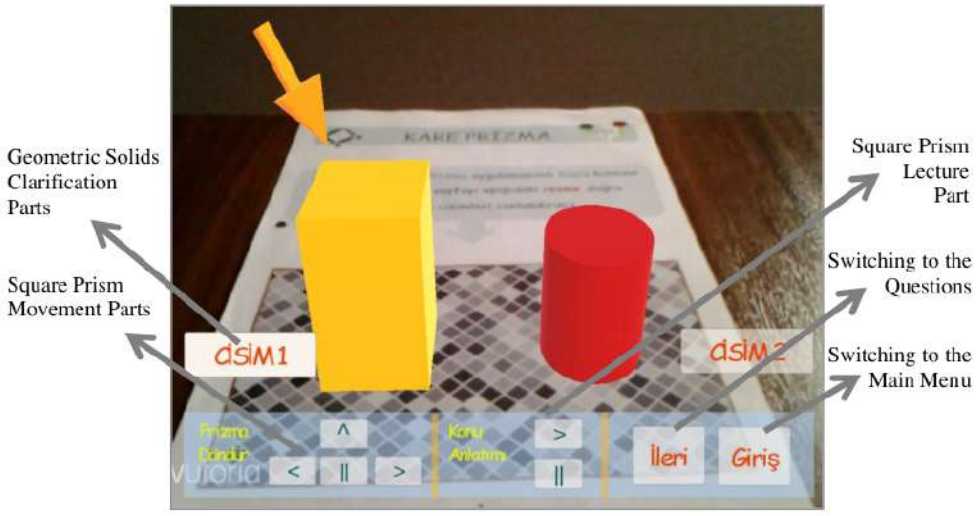


*Figure 2.* "Square Prism" concept learning material

In line with the learning material designed as illustrated in Figure 2, the application process was conducted by instructing the concept of "Square Prism" enriched with augmented reality technology to the three participant students who were each diagnosed with special learning disability.

***Implementation process***

The research was carried out in the form of a pilot application, starting-level sessions, teaching sessions, probe sessions, monitoring sessions, and generalization sessions. First of all, a pilot application was conducted and the situations that emerged as a result were determined and changes applied accordingly. Then, starting-level data were collected from the participant students using the prepared criterion-referenced measurement tool. Where answers given by the students were correct, they were recorded as correct, whereas incorrect answers or those that remained unattempted (unresponsive) were recorded as incorrect. Upon obtaining stable data in the starting-level sessions, the teaching and probe sessions commenced.

In the teaching sessions, instruction on the "Square Prism" subject from the Geometric Objects unit of the fifth-grade mathematics lesson commenced with the participant student with the assigned name of "Mert." The learning material was used and the results were recorded in the data record table together with Mert. The results of the second and third sessions were also recorded. After reaching stability with Mert, full probe sessions were then held. After the full probe sessions ended, the study then continued with the next student, who was assigned the name "Ege." In the first session conducted with Ege, the learning material was used and the results were recorded in the data record table. The results were recorded for the second and third sessions as well. After reaching stability with Ege, three full probe sessions were held. After the full probe sessions were completed, the study then continued with the student who had been assigned the name "Ali." In the first session conducted with Ali, the learning material was used and the results were recorded in the data record table. In

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the second, third, and fourth sessions, the applications were also carried out, the results recorded, and after reaching stability with Ali, full probe sessions were also held.

Monitoring sessions were initiated after the full probe was completed. The monitoring sessions were conducted 2, 4, and 6 weeks following completion of the instruction, and the results entered to the data recording table. During this process, the opinions of the participant students and their teachers were also recorded. Moreover, generalization sessions were held in the form of pretest and posttest, and inter-media and interpersonal sessions (with a different teacher) were conducted and the results then regulated.

**Findings**

According to the findings obtained within the scope of the study, Mert's correct response percentages at the starting-level indicated 8.3% in the first session, 16.6% in the second session, and 8.3% in the third session. For the instruction, probe, and monitoring sessions, a 100% correct response was obtained in each. As a result, it was observed that Mert's instruction results increased when compared to the starting-level data.

Ali's correct response percentages at the starting-level sessions were recorded as 16.6% in the three sessions. During the instruction process, there was a 91.6% correct response achieved at the beginning, which increased to 100% as the instruction process continued. Whilst the correct response percentages were 25% in the first collective sessions prior to starting the instruction process, they were 83.3%, 83.3%, and 100% in the first full probe sessions following the instruction. Results of 100% were also obtained in the other full probe sessions following the instruction. From the monitoring sessions, it was observed that the conservation of the conceptual knowledge continued with 100%, 100%, and 91.6% correct responses.

Ege's correct response percentages at the starting-level sessions were 8.3% in the three sessions. While the percentage of correct responses in the first collective session prior to the instruction was 16.6%, it was 8.3% in the second and third sessions. In the following full probe sessions, the percentage of correct responses was 16.6% in the first, 8.3% in the second, and 16.3% in the third session. Ege had a correct response rate of 100% for the instruction process. While Ege achieved 83.3% in the first post-instruction session, this increased to 91.6% in the second and third sessions. In addition, it was observed that the conceptual knowledge was gained and conserved as a result of the instruction, with 91.6% correct responses in the third session, while Ege showed 83.3% in the first and second monitoring sessions.

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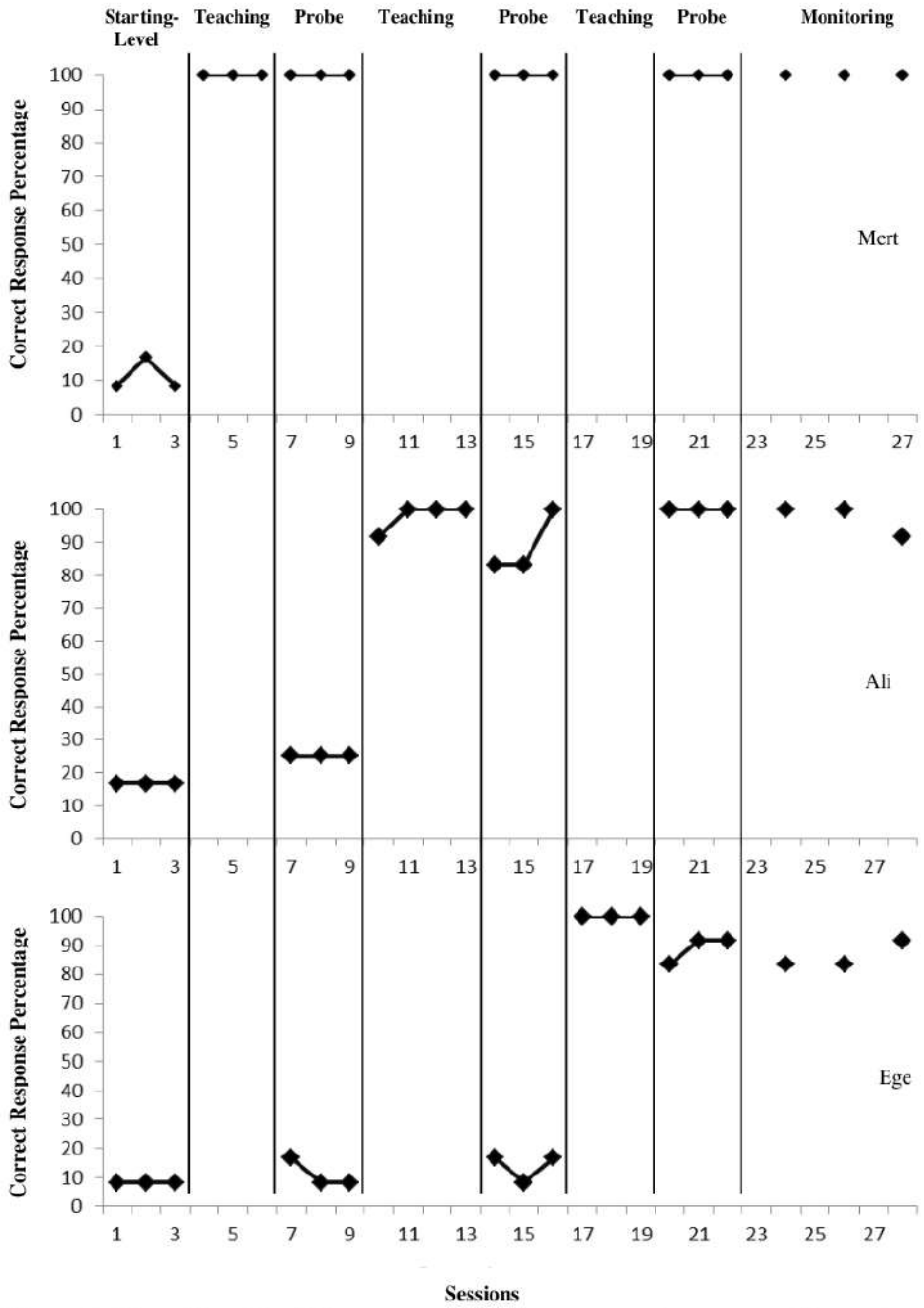


*Figure 3.* Mert, Ali and Ege's "Square Prism" concept instruction start, teaching, probe and monitoring sessions correct response percentages according to multiple probe model with probe phase

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Generalization sessions were conducted in the form of pretests and posttests applied by the students' teachers in a different environment.

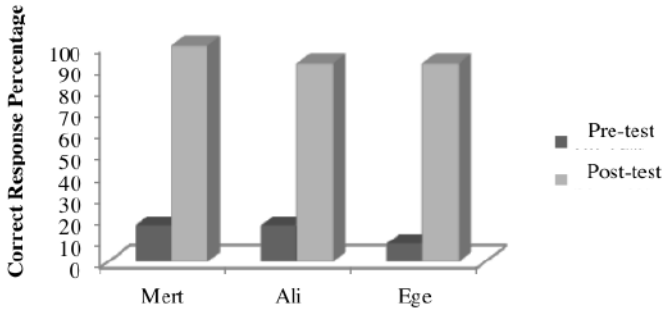


*Figure 4.* Correct response percentages of generalization sessions

When Figure 3 and 4 is examined, while the pretest data of Mert, Ali, and Ege showed results below 20%, they were determined as having increased to over 90% following application of the concept instruction process. The findings obtained from the generalization sessions indicate that students were able to generalize what they learned.

A student interview form was created and applied in order to obtain the social validity findings of the study with regards to the students. During their interviews, the participant students stated that they wanted to use technological instruments such as tablet computers in their education, to learn subjects in an entertaining way, that the usage of technology increased their attention and interest in the subject, and that they want to use technology in the future as it provided 3D animation. A teacher interview form was also applied in order to obtain social validity findings about the teachers. During the teachers' interviews, it was expressed that the usage of technology facilitates and enables the learning of the subjects, offers the 3D animation feature, visualization features, and whilst it is remarkable and interesting, it may also be considered harmful when used extensively (in terms of technology dependence).

The data were collected and analyzed in order to determine the application's reliability. For the current study, the application reliability was examined as 30%, and the number of observed behaviors was calculated by dividing the number of planned behaviors and multiplying that by a factor of 100. As a result, the application reliability was determined as being 90% for the students. In addition, samples were taken to include all stages of the study, and inter-observer reliability calculations applied for at least 30%. During this process, this was calculated by dividing the consensus of the researcher and the observer by the sum of the consensus and differences of opinion, and then multiplying by 100. Inter-observer reliability among the students was found to be 100%.

## Conclusion and suggestions

### *Conclusion*

Within the scope of the current research, it was determined whether or not the usage of content enriched with augmented reality technology in education was effective for students

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with special learning disability in learning concepts, and whether the conservation of the conceptual knowledge gained continued 2, 4 and 6 weeks following completion of the application. Additionally, the opinions of the participant students and teachers about augmented reality technology were examined. During this process, the "Rapid Prototyping Model" developed by Tripp and Bichelmeyer (1990) was employed with the aim of preparing the content enriched with augmented reality technology and the concepts involved in the content for students with special learning disability. Pre-trial and "square prism" learning materials were designed by carrying out the stages of needs identification in a rapid and planned manner, content analysis, goal determination, prototype preparation, applying the prototype, and then establishing and maintaining the developed system based on the model, which is considered suitable for computer-based teaching. Then, the questions that this research study sought answers to were resolved through application of the developed learning materials to the participant students.

When the research findings were examined, it was observed that the concept of square prism was acquired by the students as a result of the instructional process conducted with the square prism learning material prepared using augmented reality technology. Additionally, the conservation of the acquired conceptual knowledge was shown to have continued 2, 4 and 6 weeks following the end of the applied education. It can therefore be stated that the developed learning materials addressed more than one sensory organ (e.g., auditory, visual, tactile) and provided increased interaction between the students and the developed instructional content, which was considered effective in achieving the desired outcomes. In addition, it was also determined that the students performed and progressed at a level that met the criterion for the conceptual understanding of square prism by the end of the conceptual teaching process, although the number of sessions conducted in meeting this criterion with correct student response percentages were not the same. It was also revealed that all three students achieved performances of 80% or more regarding the square prism concept as instructed through the concept teaching method, and that they were able to generalize what they had learned to different people in different environments. Along with these findings, it was also observed that the tablet computer usage skills of the participant students increased during the applied learning process.

Students with special learning disability and their teachers generally had positive opinions about the content enriched with augmented reality technology. During the interviews, it was emphasized that this form of technology can be used in terms of concretizing learned content, for showing 3D animations, as an attention- grabbing and interesting teaching medium, for providing a fun learning environment, to increase learner motivation, and in ensuring the teaching of certain subjects or topics. However, the participant teachers stated that attention should also be paid to the duration of usage of such technological solutions, as long-term usage could cause detrimental effects through technology dependence.

It can be said that the learning materials enhanced with augmented reality technology generally had a positive effect on the participant students who were each diagnosed with special learning disability. Also, it was observed that the augmented reality technology, which can integrate features such as 3D images, sound and video into the real environment of learners, could also be utilized in the teaching of concepts. However, this technology has

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certain limitations as well as its noted benefits. One such limitation is that technical problems such as detection/identification can be experienced when defining qr. codes/pictures during the system design phase for the animation of three-dimensional objects. Therefore, it is necessary to prepare additional educational designs and applications in the field of augmented reality technology in order to overcome these limitations (e.g., perception, design). Programs used in the preparation of such environments due to the design of applications assisted by augmented reality technology in education and the increase taking place in research studies should be augmented, with existing platforms also needed to be improved. In particular, the increase in environments that present 3D objects as ready-made, or programs that enable them to be designed, will be seen as beneficial in terms of enriching this field.

On the other hand, it should not be forgotten that the education of students in Turkey with special learning disability is of vital importance, as well as those students showing typical development, and that studies conducted in this area will need to be increased in order to be able to offer varied teaching methods to improve the teaching and learning process. In conclusion, the current study investigated the instructional process of the square prism concept by enabling the preparation and evaluation of a three-dimensional learning environment that helped to increase the interaction of students with conceptual content in the field of special education.

### *4.2. Suggestions*

The following suggestions are put forward according to the outcomes of the current study:

- Research studies could be conducted for teaching different academic skills and concepts using programs that create three-dimensional environments;
- Applications containing contents enriched with augmented reality technology in the education of students could be designed and developed for different platforms (e.g., Education Information Network Site, books) that could be used in the field of special education;
- Similar research could be designed for different user groups in the field of special education, with similar concept teaching processes examined. In addition, the results of future studies could be observed through conducting research with more students from different age groups;
- The concept teaching process could be examined through conducting similar studies for different groups in the field of Computer and Instructional Technology education;
- Studies focused on learning different concepts (e.g., cube, cylinder) could be devised that develop different contents enriched with augmented reality technology;
- Different applications should be designed and developed by applying educational designs in order to integrate augmented reality technology into educational environments. Thus, technical problems such as imaging and detection could be resolved;
- Existing software should be analyzed and their structures and possibilities investigated prior to developing contents revived with augmented reality technology. In addition, the created applications could be arranged for use also in mobile environments;

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- It is necessary to realize the teaching design processes as a whole, with imaging, perception, coding, content etc. from different perspectives in the design of content assisted by augmented reality technology;
- Research is often conducted on augmented reality technology at the technical level, especially in the field of engineering. However, insufficient research has been conducted on the design of content assisted by augmented reality technology in the education dimension. Therefore, content assisted by augmented reality technology could be diversified by making use of instructional design processes in the field of education, especially in the area of special education;
- New technologies used in the education process in the field of Computer and Instructional Technology could be investigated and integrated into special education.

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