

Attention Deficit and Hyperactivity Disorder Among Adult Learners: Diagnosis and Pedagogy

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Abstract

Attention deficit and hyperactivity disorder (ADHD) is a psychological condition that may adversely impact pedagogy. Popular characteristics of ADHD may lead to difficulties in managing life as a whole. However, this problem can disturb a learner to a great extent, so his academic performance may be bad despite the fact that the learner is not that mentally poor. Therefore, it's important to explore as to what could be done in order to enable learners with ADHD so their academic performance is not much affected. There are three main signs and symptoms of ADHD: inattention, impulsivity and hyperactivity. It is likely that X learner reflects one symptom more than the other(s). Thus, it becomes more crucial to think about a pedagogy or strategy to cater to the need of a learner with ADHD, its types in general and inattentive or impulsive or hyperactive learner type in particular. It is also possible that one learner is affected by one sub type, or all the three. In this circumstance, very specific pedagogy will be required such as differentiated instruction (DI). In this mixed method study, an adapted questionnaire and an interview schedule were utilised to elicit data which were analysed mainly qualitatively. Results will be applied to diagnosing ADHD or similar problems, their impact on learning and designing a compatible pedagogy.

Keywords: ADHD, pedagogy, inattentive, impulsive, hyperactive, academic performance

1. Introduction

Knouse and Safren (2010) stated that attention deficit and hyperactivity disorder (ADHD) is nothing but a psychological disorder which is related to individuals of all ages; however, the ratio or percentage differs from group to group. (Canals et al., 2016; Fayyad et al., 2017). ADHD is a developmental disorder that persists into adulthood for many individuals, say Abecassis et al (2017).

Rogers et al. (2009) are of the opinion that ADHD is a kind of common neurobehavioral disorder which is found in childhood. It eventually affects a lot of learners across the globe starting from early 1940s. ADHD can be triggered by other associated factors: may be environmental or psychological.

Barkley (2016) defined ADHD as a "developmental disorder having 'inattention', 'impulsivity' and 'hyper-activity'". It is also said that ADHD is usually chronic in nature which normally starts in early childhood. These issues are associated with deficits or shortage in rule-

governed behavior which leads to work performance over time. ADHD affects school students more because it generally starts at early age. Learners with ADHD pay less or no attention to lectures, but are greatly attracted towards other things or activities. ADHD in adults is connected with many negative outcomes including poorer academic performance. (Abecassis et al (2017)

1.1 ADHD and pedagogy

The success of a pedagogy depends on both general and mental health of the learners and instructors. In the present study, learners with ADHD were studied as a whole, and then by dividing into ADHD's sub-categories: the groups of inattentive, impulsive and hyperactive learners. Teachers were consulted about the behaviour of each selected adult learner. Personal observations were made, their grades were matched, formative assessment was done and conclusions were drawn. Finally, a compatible pedagogy was proposed in accordance with the needs of the learners with ADHD/types.

1.1.1 Attention deficit and hyperactivity disorder

As mentioned above, ADHD has been divided into three subtypes: inattentiveness, impulsivity,

and hyperactivity. 'Inattentiveness' is behavioural condition in which an individual fails to pay enough attention. It also happens that the sufferer is sometimes completely absent minded that ultimately reflects some characteristics such as forgetfulness, disengagement, or distractibility. Such signs are quite common in learners with ADHD which eventually affect their learning to a great extent.

'Impulsivity' is a common trait and prevalent tendency which is usually found among school going children due to which they normally act without thinking. The logical decision is usually affected. In other words, they are impulsive. This kind of behaviour endangers wrong decisions which the individuals often repent after doing something. Following signs indicate someone suffering from impulsivity: aggressive behaviour, restlessness, interrupting others and being easily distracted. If we try to cross-check these traits, we can identify quite many students who are affected by impulsivity due to which their academic performance is also not up to the mark. However, these learners have not been assessed medically by a medical professional, consequently they are undiagnosed individuals possibly with ADHD.

'Hyperactivity' is a state in which one is unnecessarily too active which is not usually required. For normal people, it seems like an abnormal behaviour. Such a trend is normally found in children at early age, but there are many adults who are abnormally active for no obvious reasons. Hence, it is essential to bear in mind that each hyperactive child is not a case of ADHD. He/she may be highly brilliant, the best performer in the class, extra sharp in memorization and highly attentive in the class. On the other hand, his/her energy may not be appropriately consumed, therefore he/she is hyper-active. Moreover, such a feature is neither harmful for him nor for others.

1.2. Need of proper diagnosis of ADHD

There is a need of diagnosis of ADHD both medically and educationally. Hence, it is quite difficult to get students checked medically in schools. There are two main reasons: the students will never accept that they have any such issue that can be associated with mental, neurological or psychological issues. Some of them may not be aware while quite many will try to hide thinking that it is perhaps an embarrassment. Similarly, parents are also conscious and try to ensure that nobody knows about their wards' psychological or behavioural issue even if they actually suffer. Therefore, teachers can contribute to both kinds of

diagnoses: medical and non-medical (academic), and play a very significant role in managing behaviour in coordination with the school counsellor as well as in the process of getting learners diagnosed by a medical practitioner for medications if needed.

1.3. Pedagogy

Pedagogy can be roughly and operationally defined as an art of imparting knowledge. It may be considered as the science of teaching as well. Etymologically, it has a connection with the children, however, it can be contextually used for education or teaching at any level. The pedagogy which is mostly required in the case of special children or the 'challenged ones' is derived from 'special education'.

1.3.1 Special education

Special education can be roughly considered as the process of interaction between the instructor(s) and the special learners in a differentiated learning environment. McLaughlin, (1995) special education is associated with revisiting and redefining of the processes under educational setting. Khan and Asif (2017) state that 'special learners' are those who are not able to pursue prescribed curriculum that is designed for the children of their age. In other words, special children face difficulties in attaining the curricular aims while their peers don't normally face any difficulties. Studies have indicated that cognitive issues are extremely crucial for special students (Vaughn & Thompson, 2003). Students selected for special education are not always gifted learners. (Mayes & Moore, 2016). It means, slow learners can also fall under the category of special ones. Research also shows that students possessing moderate intellectual disabilities such as 'Down syndrome' can be brought back to the general stream under the general education setting after they gain experience in different sub- skills and language aspects: literacy, vocabulary, grammar and over all comprehension (Dessementet, Bless & Morin 2012). Thus, it can be said that special education can bridge the gap and prepare learners who can compete with their peers if the learning environment is appropriate. It has to be born in mind that special learners are not only those who are categorised as 'challenged' or 'handicapped'.

The present researcher feels that dealing with learners with ADHD requires specific intervention during the teaching-learning process. As mentioned, special learners need specific pedagogy. In the present case, Differentiated

Instruction (DI) has been tried out to deal with learners with ADHD.

1.4. Differentiated Instruction

The idea of differentiated instruction (DI) presupposes the existence of diverse learners in a single classroom. All learners don't need same teaching style/method. It is not because of mere theoretical assumptions but also based on proved learning styles of four types: auditory, visual, kinaesthetic or reading-writing. Getting clues from the theory of individual differences (Conway et al., 2020), it may be conceived that most of the learners acquire knowledge in different ways and contexts. Therefore, a single teacher is seldom able to deal with learners with special needs in a single class if he follows traditional teaching method(s). Raza (2020) supports the idea of different teaching models for diverse learners.

1.4.1. DI and Target Based Tiered Instruction

DI as a teaching strategy focuses on target based tiered instruction which includes three components: content, process and products (Tomlinson & Imbeau, 2010). A differentiated instructor (teacher) initially designs tiered tasks in accordance with the difficulty levels and the students' needs. 'Outcomes' come next to be considered. Tiered assignments can also be differentiated pertaining to the aims and the 'product'. However, differentiated resources can never be ignored if one aims to get good results.

1.5. The study

1.5.1. Statement of the Problem

As it is a matter of immense importance and pedagogic need in the field of research in the area of special education in general and English language teaching in particular, the present research problem has been undertaken. The research aims at the evolution of teaching strategies for learners with ADHD. Differentiated instruction (DI) has been conceived as one of the strategies for teaching English to adult learners with specific problems caused by ADHD. The evolution of strategies took place after identifying symptoms of the ADHD, making diagnosis (in educational context), studying learning styles, matching with ADHD types.

1.5.2. Objectives

Main objectives of the present study are:
 -to diagnose ADHD features in English language learners of foundation year,
 -to study specific needs of learners with ADHD,
 -to evolve a compatible pedagogy such as

differentiated instruction (DI).

1.5.3. Research questions

- 1- What are the characteristics of learners with ADHD in a class?
- 2- Why are specific pedagogies needed?
- 3- What are the effects of DI strategies on learners' performance?

1.5.4. Participants

19 students were identified as ADHD cases via teachers' questionnaires (adapted rating scale). The teachers (N=6) helped in the process of identifying the cases, used ADHD self-reported questionnaire. Later, selected students were divided into 3 groups to see if different DI strategies were useful.

1.5.5. Tools

Two already existing tools were utilised: one for identifying ADHD (a teachers' questionnaires and interview schedule (Appendix-A & B). In addition, four different DI- strategies (based on ADHD sub types) were developed by the researcher to find out usefulness (Appendices: C, D, E, F). Permissions were sought from the relevant authority to re-use/adapt the tool(s).

1.5.6. Ethical consideration

All dimensions of ethical considerations were followed. The purpose of research was communicated to the concerned participants. Confidentiality of data was also ensured. Similarly, teachers were also briefed about the research aims. In additions, original researchers were informed about the use and adaptation of their tools for which formal permission were sought.

2. Literature review

2.1. ADHD, causes and its effect on learning outcomes

As mentioned, ADHD is a psychiatric disorder that usually starts from childhood and continues. Biederman et al. (2010). ADHD affects approximately 5% to 7% of the school going children (Thomas et al., 2015) and nearly 3% of adults. (Fayyad et al, 2017). Younger children in a school are more likely to receive a diagnosis of ADHD than their seniors because of age-based variation in behavior that may be attributed to ADHD. (Boland and Tatonetti, 2019). Connection between parental educational achievement and child's symptoms of ADHD and academic problems are attributed to due to shared family environmental factors. says [Torvik](#) (2020).

Though the actual cause of ADHD is unknown, it

is certainly a neurologically-based medical problem. It is also known that parents, teachers or others do not contribute to ADHD. Attention related disorder is a tendency towards 'low self-esteem' that can affect targets of all groups of children and even adults, but young students in particular become soft targets in most cases because they are sensitive, and concerned with academics which require active minds. Some children may be affected by additional issues such as 'anxiety' and 'conduct disorder' which may further worsen the case of ADHD.

According to learners with ADHD are at the risk of academic underachievement. (Tan and Cheung, 2008). This is why special education needs (SEN) could be considered essential, therefore the idea should be incorporated through specific training standards" (Nash and Norwich, 2010, 473). To elaborate further, ADHD has been found associated with poor learners' grades (Abecassis et al (2017), and inadequate test scores in reading and maths. (Loe & Feldman, 2007)

2.1. Characteristics and prevalence of ADHD in tertiary students

Analysis of students with ADHD at US universities is usually done according to the standard prescribed by the DSM-IV (Diagnostic and Statistical Manual of Mental Disorders, 4th Edition). The manual postulates three basic criteria of diagnosis of ADHD and its types: inattention, impulsivity and hyperactivity. (DuPaul et al. 2001). Impulsivity can't be considered strictly academic in nature; however, it does affect the behaviour of a student. Usually ADHD among learners is diagnosed through regular 'inattention' or lack of focus. The symptoms of ADHD and its sub-types have clear negative effects on students of tertiary education as well. Learners with ADHD demonstrate poor achievement in academics. (Hinshaw,1992). Similar results were confirmed by Barry et al. (2002).

Though, data on individuals with ADHD may not be updated, only in North American college students, self-reported cases of ADHD ranges from 2% to 8%. (Frazier et al, 2007; Garnier-Dykstra, 2011). To be very specific, in a study comprising 1,080 US tertiary students, 12% were diagnosed through self-reporting as clinically significant levels while only 2% were formally diagnosed ADHD patients. (Garnier-Dykstra et al., 2010). A study in Oman revealed characteristics of ADHD, 'Among those 221 schoolchildren, 150 (67.9%) showed signs of 'inattention' and 'hyperactive-impulsive' behaviour. (Al-Sharbati et al,2011)

This kind of a problem is not specially connected

to a particular region, however, honesty in revealing the disease through self-reporting is itself a big issue. Therefore, the actual count and level of ADHD is always doubtful due to lack of accurate information. Despite all odds, 15.4% cases were found in Iran while in Kenya the level has been around 23.7% for tertiary students. (Mosalanjad et al., 2011). Nearly 13.6% (around 3.3 million) of adolescents between 12 to 17 years of age are affected by ADHD in the US. In addition, 388,000 (nearly 2.4 %) of young children between 2 to 5 years and around 2.4 million (nearly 9.6 %) of school-age children between 6 to 11 years have been diagnosed as individuals with ADHD. (Melissa et al, 2018). However, global prevalence of ADHD in adults is estimated at nearly 2.8 percent. (Fayyad et al., 2017). A study estimates of prevalence of ADHD among adults is 0.96 percent, however this was reported around 5 years ago. (Chung et al., 2019). Nearly 2 to 8 % of college students self-reported that their symptoms resembled ADHD. (DuPaul et al, 2009).

In a nutshell, it can be concluded that ADHD alone is a serious issue, but it becomes more dangerous if it is unattended. Therefore, there is always a need of systematic diagnosis and treatment by medical intervention (if needed) or behavioural counselling or both.

2.2. ADHD in educational sector and Pedagogy

Though clinical diagnosis of ADHD is not always possible in each case, the institution-based psychologist(s) and teachers can assess the behavioural patterns of the suspected students, and try to deal with them thinking they are having some or many symptoms of ADHD. The exhibition of certain specific features may clearly indicate those patterns which may not allow X teacher to enjoy his class due to unexpected behaviour of some or many learners with ADHD. Therefore, a systematic study was inevitable to study ADHD's concept, symptoms, causes and adverse effect on the learning outcomes.

It has been felt that instructors are supposed to know about ADHD so that they can deal with learners with ADHD. (Alshehri et al, 2020). In the modern education scenario, diagnosis-based pedagogy has become a very common practice. Such pedagogy becomes more crucial when the pedagogue has to deal with special cases like ADHD. In this situation, most of the time, based on action research or intensive observation, an instructor or facilitator has to evolve a pedagogy in general and e-pedagogy in particular to attract in-attentive learners. Thus, differentiated instruction is critically

considered important by at least those teachers who are aware of this strategy which can be integrated with technology as well.

2.2.1. Differentiate Instruction (DI): concept, importance and feasibility

It is believed that differentiated instruction (DI) is a principle which emerged from a philosophy that postulates teaching students with diverse backgrounds. In other words, 'Differentiation' follows a compatible instruction to cater to the needs of individuals having different backgrounds. (Tomlinson, 2000; Servilio, 2009). DI is modifying teaching to suit one, small group, or all learners. (Magableh et al, 2020). He talked about two ways to classify students into differentiated classes: grouping students by mixed-ability school-rooms, and to split by streaming.

The aims of dealing equally with different kinds of learners can only be attained by focusing on the learners' characteristics. Tomlinson (2001) identified those characteristics as readiness, interest, and learning profile. VanSciver (2005) advocated the idea of identifying those characteristics for students' success in learning (VanSciver, 2005). Major benefit of DI is better performance in learning. Levy (2008, 164) claims that with the tools of differentiated instruction, the child can be taken towards further success.

Some critics of DI are of the view that using DI requires strong command of the technique of teaching. In other words, utilisation of DI is not actually easy. (Hertberg-Davis, 2009). Despite doubts on the usability and feasibility of DI on senior students, Tomlinson (2000) mentions "a high school science teacher who undertook an action research on the effect of differentiation saw positive results" (p. 30). Though, DI is gaining fame in many elementary and secondary schools internationally, not much has been written about the benefit of DI in higher education. (Santangelo & Tomlinson, 2009).

2.3. Research gap and Importance of the Study

Lot of researches have been undertaken in the area of ADHD, its effect on learners and some techniques of controlling learners' behaviour. Nothing concrete related to specific pedagogy such as differentiated instruction has ever been proposed in the present context of research while there are many students in a class who appear to be quite like the ones who can possibly suffer from ADHD. It is known that teachers, counsellors or psychologists can't prescribe medication, but a compatible pedagogy can surely be evolved for

such students.

The need for 'differentiated instruction' arises under 'special education' when learners face issues basically due to being either bright, slow or different in educational setting. In the present context, learners who belong to ADHD category are seldom able to be attentive for a long time while sitting in a class. As a result, they fail to learn the content and their performance fall below the expected levels.

Differentiated Instruction (DI) can be thought of as the practice of evolving a compatible instructional strategy. It focuses on target based tiered instruction which includes three components: content, process and products (described earlier). A differentiated instructor (teacher) initially designs tiered tasks in accordance with the difficulty levels, and the students' needs. 'Outcomes' are the next to be considered. Tiered assignments can also be differentiated pertaining to the 'product'. However, differentiated resources can never be ignored if one aims to get good results.

The English classrooms in Arab countries in general and Saudi Arabia in particular often characterise differently due to various academic and pedagogic reasons. Therefore, an attempt in this direction is certainly of great significance. The findings and results may be instrumental in contributing to the development of curriculum and specific teaching strategy.

DI can be tried out at any educational level, however, in the present context of this research, the participants are foundation year students pursuing two levels of English proficiency which is a pre-requisite for entering into the specialisations (majors) in their second year. The necessity for DI becomes evident when it is realised that most Arab countries these days, learning English is becoming important, however there are some challenges. The learners belong to different educational backgrounds like any other classroom. Some students seem to suffer from ADHD as well. It is expected that DI as a technique can yield positive results if utilised judiciously.

3. The Present Study

3.1. Methods and procedures

Despite the fact that the present work is basically mixed type of research, however the focus is on qualitative-descriptive approach. Mixed method approach has been incorporated to answer research question(s) and meet the aim and objectives of the research. The methodology has been employed in three phases. First, ADHD cases were identified after taking permission to use a

teachers' questionnaire/rating scale (Appendix-A). Next, the cases and issues were further authenticated by adapting an interview schedule used for 6 teachers (Appendix-B) after getting permission from the developer. Finally, DI was developed and used as different strategies according to learners' styles based on VARK model: visual, auditory, kinaesthetic and read & write (Virleen, 2010). These models' characteristics were matched with the ADHD types and corresponding strategies were designed.

4. Data collection & analysis

4.1. Identification of students with ADHD

Vanderbilt ADHD Diagnostic Teacher Rating Scale was used to identify the ADHD affected learners. Based on the scores allotted to each item (01.1, 2, 3) if a learner scores 45 and more, it was decided to consider him/her the ADD case. The criterion was fixed in consultation between the researcher, concerned teachers and education/educational psychology experts.

4.1.1. Analysis of the rating scale/questionnaires

Learners who scored more than 45 scores, were identified as the case of ADHD. The criterion of 45 may not be exactly precise and accurate, but it puts a line of demarcation between learners with ADHD and without ADHD. Cases just close to 45 (such as 42, 43, 44) may also demonstrate some prominent symptoms, however a different treatment was not provided. Hence, it is important for a teacher to observe two things for better pedagogy: ADHD signs and learning styles: Auditory, visual, kinaesthetic and read-write types. These will help the teacher to tackle the issues associated with ADHD learners or nearly ADHD learners in addition to non-ADHD learners. Since the class follows inclusive pedagogy, different student types are obvious, but one methodology can never be very effective. Therefore, evolution of DI strategies is inevitable.

4.1.2. Thematic analysis of the teachers' interview

Theme.1: Learners' behaviour

Teachers shared openly regarding the behaviour of those students who were suspected to have been behaving like the ones suffering from ADHD or similar disorder(s). Students are either very lazy due to lack of attention or mixed with other psychological issues or they are hyperactive in responding without any need. Sometimes they try to catch attention by over reacting. And, above all, they are distracted by other activities but academics such as chatting with the classmates or

using mobiles excessively while the teachers try to impart knowledge and skills. Towards the end of a class, during recapitulation of the lesson, the learners usually fail to demonstrate any change in their learner behaviour which can be concluded that learning actually did not take place.

Theme.2: Teaching challenges

Based on the teachers' responses, it was concluded that teachers face numerous problems and challenges in a class which has some students with ADHD. The learners with ADHD exhibit their behaviour quite abnormally by doing unwanted activities, not paying attention, grabbing teachers' and others' attention unnecessarily, raising inappropriate questions, answering those questions which are asked to others, seeking permission to go to washroom more frequently and sometimes misbehaving with the teachers unintentionally such as speaking very loudly and rudely.

Theme.3: Learning difficulties

Teachers reported that many learners with ADHD face difficulties in learning new content because they don't focus on the lecture/class when the teacher teaches. Such learners pay attention to anything else but the material being taught. In case, the content is little hard, they lose interest further and get lost in the world of imagination. They don't do it deliberately but they become the target of ADHD.

Theme.4: Teaching methods

The interactions with the teachers show that most of them do not employ any strategy to deal with the challenges they face in a class which includes some learners with ADHD. In fact, it was found that most of them were not aware of some fruitful strategies that can minimise the issues of behaviour, management of the class and increase in academic performance.

Theme.5: Technology integration

Teachers reveal that they utilise technology as they are supposed to integrate for a normal classroom. However, it was found that they don't usually utilise any specific strategies that can yield better results for those students who are affected by ADHD or similar issues.

Theme.6: Need of professional training

It was elicited both directly and indirectly that concerned teachers did not receive any specific training. However, they are aware of such

behavioural issues as they read literature, attended some online courses in which such issues were mentioned.

4.2. DI strategies and indicator of effectiveness

ADHD learners were grouped into four groups: 1 (for inattentive), 2 (impulsive) and 3 (hyperactive, and 4 (combined one). Based on the feedback of identified learning styles of most of the learners, DI strategies were evolved to see qualitative effectiveness via indicators of disciplined behaviour, effective class management and better performance. Hence, it is important to know that learners' grades were considered as quantitative indicators.

5. Findings, Conclusions and Recommendations

5.1. Findings

The study revealed following results:

Research questions

1- What are the characteristics of learners with ADHD in a class?

It was elicited from teachers' reporting scale that students suffered from ADHD. Later it was also classified if the learners had sub-types such as inattention, impulsiveness or hyperactive types. Each kind has specific sign and symptoms and even learning styles. DI strategies were evolved based on ADHD types as well as learning style types observed in the class by different concerned teachers. It was found that treatment was not very effective on account of academic performance (results of the exams), very useful in the management and creation of appropriate learning environment, though.

Research question: 2- Why are specific pedagogies needed?

ADHD is a psychological condition. Education as a discipline utilises a lot of concepts of psychology. Keeping the seriousness of ADHD in educational scenario in particular, and students' behaviour and attitude towards learning, specific pedagogy is a must.

Research question: 3- What are the effects of DI strategies on learners' performance?

The study revealed that DI strategies evolved and used showed positive effect on management of the class, however it was not tested if it had statistically significant or not due to the sample size and other research-methods related issues. The authors and some other teachers were of the opinion that ADHD group must have a specific

pedagogy based on different categories of ADHD and learner type. It may help to a great extent. However, it is also important to consider that DI strategies pose greater trouble to the concerned instructor if he does not know about special education.

Discussions

Some learners were found as having ADHD. They have been found as suffering from some potential issues such as poor academic performance due to inattentiveness, impulsivity, hyperactivity and similar psychological issues. Some learners have not been formally diagnosed as ADHD case, they demonstrate signs and symptoms of ADHD, though. In the absence of a formal diagnosis and interventions, the learners with ADHD (though undiagnosed) would continue to get affected physically, mentally and academically.

Researches have sufficiently indicated that Academic difficulties for learners with ADHD initially start in the childhood. However, problems continue to persist during adulthood and even later. Popular symptoms of ADHD are: inattentiveness, hyperactivity, impulsivity, and aggression, but likely to diminish overtime, do not completely disappear, though.

The obvious effects of ADHD that appear on academic activities are: activity limitations, hurdles in learning, reading disability, writing issues, problems in calculating, doing general tasks, difficulty in carrying out single, multiple or difficult works, difficulty in handling one's own behaviour, attitude, stress and psychological demands, and suffering from communication disorders.

Major disadvantages caused by ADHD are: educational problems, problems with community, social, and civic life, poor energy, inattention, weak memory, psychomotor issues, poor time management, problem solving problems etc. Learners with ADHD fail to score good grades, and perform poorly in academic achievement testing.

Since most learners with ADHD have not been formally diagnosed by a clinical expert, it is always better in academic setting to try behavior management. Combined Management of ADHD is also required even in the context of academic setting. It is likely that multiple treatment approaches are needed, however, treatment does not always mean medical intervention. In terms of academic performance, multimodal treatment may include academic assistance, organizational skills training, social skills training, remedial intervention in reading, phonics etc.

Based on issues caused by ADHD, diagnosis was

felt as important prior to designing and using DI strategies, it was found that the learning environment was better, and students were more systematically managed in a single class. However, it was challenging for the teacher to handle a normal class with learners with ADHD. In other words, the environment looked more like 'inclusive in nature'. It is always required to engage special learners so they don't get much time to get distracted. The idea worked well, and they hardly found time to use mobile or chat with each other without any need. It is a different issue when they purposely interact to do an assigned task as cooperative learning technique.

It is usually thought by most researchers, pedagogues and teachers that more interaction requires more attention. Therefore, the DI strategies made the ADD learners in general and inattentive ones in particular by interactive sessions. Technology played important roles in yielding this outcome. By integrating strategies and technologies, they did not trouble the teacher much for seeking permission to leave the class for different reasons.

5.2. Conclusions

ADHD is a psychological condition that affects the behaviours of the individuals including learning behaviour of students ranging from primary to tertiary education. We remain ill-informed about some of the signs and symptoms, and how to cater to the needs of learners with ADHD and improve academic and educational outcomes.

In the present study, some learners were identified as the cases of ADHD. It was also found out as to which category of ADHD they belonged to. Based on the teachers' scale responses and interviews DI strategies were evolved and utilised and noted that the 'differentiated instruction' impacts the learners with ADD. The impact is more on the management, control of the class in order to impart knowledge, and develop required skills of specific types. It has been usually noticed that ADD learner's class is not difficult to teach but a challenge to deal with due to different factors.

The findings are in tune with the study carried out by Weyandt et al (2013) which contended that the ADD prevalence is increasing and it is likely to exert negative impact on many adult learners. It is often noted that adults with ADHD may yield better outcome if they are motivated, self-motivated and good at organisational skills.

The findings suggest that learning style-based instruction may improve learning because the instruction is likely to be logical, systematic and

pedagogic. Rogowsky et al (2020) are also of the same opinion. [Dekker et al. \(2012\)](#) confirmed that nearly all the learners have preferences for auditory, visual or kinaesthetic learning styles. In this connection, found similar results were found by [MacDonald et al. \(2017\)](#).

DI has always been good for diverse learners, slow students or inclusive ones. (Khan, 2019). Yet many researchers criticised its feasibility at a particular stage of education. Mansor et al (2016) endorsed the advantages and disadvantages of accommodating students by ability. It has been noticed by many DI experts that application of DI is not an easy task (Hertberg-Davis, 2009). Though usability and feasibility of DI on senior students is cynically questioned, Tomlinson (2000) contended that the effect of differentiation yielded positive results. (p. 30)

5.3. Limitations

The study has some limitations:

The sample size is not big so statistical analysis for significance difference in students' academic performance was not employed. Internal threat was not completely removed as statistical validity and reliability was not tested due to small sample size and qualitative nature of study. In addition, both the tools were adapted. External threat remains as the findings can't be generalised because statistical analysis of quantitative data was not performed. Finally, sampling technique may also not be free from limitations as the participants were purposefully selected due to convenience.

5.4. Implications for Practice

This study contributes to curriculum modification in general and teaching methods in particular. There is a need to revisit content (both print and online) to attract the learners with ADHD. However, a professionally trained teacher will be able to accomplish the targets in a better manner. Therefore, there is a need of intensive professional development. There is a need of specific pedagogy for special children. Presence of learners with ADHD makes a class of 'inclusive' type, therefore a compatible pedagogy for diverse learners in inevitable. Differentiated instruction is basically a philosophy and teaching principle which can be transformed into a pedagogy consisting different strategies. In order to do so for learners with ADHD, the sub types of ADHD need to be diagnosed in addition to learning style preferences. In sum, an appropriate strategy needs to be evolved. Instructors can better do this if they are professionally trained in curriculum development

and special education. There is a need to revisit curriculum, courses and even teaching methods as per the need of students with ADHD.

5.6. Future research suggestion

Based on limitations, future researches can bridge the gap. In other words, there is a need of controlled but large-scale studies to explore if current or new interventions are able to enhance skills in reading, writing, or other skills, and raise percentile of grades as well as performance metrics. Future studies must specify diagnostic criteria for identifying ADHD, subtypes, and a justification of 'inclusion'. Sample selection is also a crucial issue which should be logically dealt with in future researches. Lot of researches have so far been undertaken in the area of diagnosis, ADHD prevalence and interventions. However, lot more has to be done in local perspectives. A broad-based combination of all stakeholders such as parents, relatives, teachers, peers and health care providers must collaborate to initiate interesting and inevitable research problems and then design a model or pedagogy, implement it, analyse the outcomes and conclude.

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Appendix –A: Vanderbilt ADHD Diagnostic Teacher Rating Scale

Made available with permission from M. Wolraich, the main author). This form has not been modified (www.brightfutures.org)

Name _____

(optional): _____

Experience: _____ years

Name _____ of _____ the _____ student:
Grade: _____

Instruction: Please tick the appropriate frequency: 0, 1, 2 or 3

Frequency Code: 0 = Never; 1 = Occasionally; 2 = Often; 3 = Very Often

1 Fails to give attention to details or makes careless mistakes in schoolwork	0	1	2	3
2 Has difficulty sustaining attention to tasks or activities	0	1	2	3
3 Does not seem to listen when spoken to directly	0	1	2	3
4 Does not follow through on instruction and fails to finish schoolwork	0	1	2	3
5 Has difficulty organizing tasks and activities	0	1	2	3
6 Avoids, dislikes mental efforts	0	1	2	3
7 Does not seem to listen when spoken to directly	0	1	2	3
8 Does not follow through on instruction and fails to finish schoolwork	0	1	2	3
9 Has difficulty organizing tasks and activities	0	1	2	3
10 Avoids, dislikes mental efforts	0	1	2	3
11 Loses things necessary for tasks or activities (assignments, pencils, books)	0	1	2	3

12 Is easily distracted by extraneous stimuli	0	1	2	3
13 Is forgetful in daily activities	0	1	2	3
14 Leaves seat in classroom or in other situations in which remaining seated is expected	0	1	2	3
15 Is "on the go" or often acts as if "driven by a motor"	0	1	2	3
16 Talks excessively	0	1	2	3
17 Blurts out answers before questions have been completed	0	1	2	3
18 Has difficulty waiting in line	0	1	2	3
19 Interrupts or intrudes on others (e.g., butts into conversations or games)	0	1	2	3
20 Loses temper	0	1	2	3

Appendix-B

Teacher interview (N=6) (Adapted from Samira (2013)

Sajadi, S.S. (2013). The 7Ms pedagogy model: Instructional design for learners with Attention-Deficit Hyperactivity Disorder. Doctoral dissertation, Brunel Business School, Brunel University, June 2013

<https://www.semanticscholar.org/paper/The-7Ms-pedagogy-model%3A-Instructional-design-for-Sajadi/Odc200021f1a86acec2298be0b686bd1a4605800>

Q1. Can you please tell me about your position and role at school?

Q2. Please explain how a child with ADHD might behave?

Q3. What are the main challenges of ADHD in the classroom?

Q4. Please tell me about observable learning difficulties that ADHD might have?

Q5. What kind of teaching methods you apply in your classroom to teach ADHD? children?

Q6. Do you use specific delivery learning materials (e.g. internet, multimedia? social network)

Q7. Are they visual or verbal learner?

Q8. How do you rate the appropriateness of the learning materials?

Q9. Did you attend any training sessions regarding teaching learners with ADHD or other behavioural issues?

Q10. Is there anything else you would like to share?

Appendix: D

Differentiated Lesson for impulsive ADHD –Group: B (Auditory and visual learners)

Objectives

By the end of the lesson, the learners will be able to: 1- listen correctly the model lesson by the teacher, 2- read the text planned for the lesson, 3- learn new words through audio-visual (sound, meaning and use) 4- use the words in sentences/paragraph, and read them again, 5- learn reading through recording their oral reading,

share with the peers and teachers

Strategy #1:

1- I Asked my students with ADHD to watch videos and listen to the audios to shift their impulsive behaviour such as excess mobile use for surfing and chatting,

2-prepare oral presentations about the subject matter: this can facilitate each other's to listen to, give feedback or at least feel the difference, and correct based on the audio track, visuals and online dictionary,

3- also asked them to listen to some other tracks even audio-visual together. But focus on the audio only for listening comprehension. Listening enriches vocabulary and pronunciation learning at the same time.

Strategy 2:

Though it is not mostly understood as appropriate to incorporate reading aloud in an auditory class yet reading aloud offers an opportunity to the reader to listen his reading, and the listeners can find out errors in reading. Therefore, listening in this case becomes both the tool and the target. However, classroom should have a peaceful environment in order to minimise disturbance.

In addition, remedial teaching will be required at the existing language clinic unit at the department.

Home Assignment: the tasks will be chosen and assigned that can facilitate learners to develop self-learning habits and skill development. Integration of technology will be an added advantage. Listening to audios, and tracks can increase motivation, and learner can feel more involved as it will suit his learning style.

Appendix: E

Differentiated Lesson for hyperactive learners – Group: C (Kinaesthetic style)

Learning Objectives

By the end of the lesson, the learners will be able to: 1- listen correctly the model lesson by the

teacher, 2- read the texts/paragraphs planned for the lesson of 50 minutes, 3-learn new words through audio-visual (sound, meaning and use) 4- use the words in sentences/paragraph, and read them again, 5- act and prepare oral presentation 6- learn reading through recording their oral reading, share with the peers and teachers 7- record reading by different learners and exchange with each other.

Strategies

It is likely that hyper-active learners may be Kinaesthetic style learners, so a teacher can exploit this opportunity and evolve a strategy compatible for such learners.

1- I integrated storytelling memory game as a warm up exercise for actual reading class, 2- I gave demonstration, and engaged learners in similar activities, 3- I used '[realia](#)', or real life objects by bringing into the classroom, 4- I asked to create a vocabulary log or semantic web, 5- I asked them to draw shapes or diagrams for some words by hand or using technology 6- I facilitated learners by asking them to practice nouns or verbs by doing some actions : one can act and the other may identify the role (in selective case). 7- do and show activity (technology may be used) 8-used 'Jeopardy' as a teaching strategy for kinaesthetic learners.

Home Assignment: the tasks will be chosen and assigned that can facilitate learners to develop self-learning habits and skill development. Learning by doing is a favourite style of a kinaesthetic learner, therefore he should be involved in doing projects etc.

Appendix: F

Differentiated Lesson (combined ADHD) –Group: C (Read -write & audio-visual learners)

Learning Objectives

By the end of the lesson, the learners will be able to: 1- listen correctly the model lesson by the teacher, 2- read the texts/paragraphs planned for the lesson of 50 minutes, 3-learn new words through reading using audio-visuals wherever feasible (sound, meaning and use) 4- grasp the contextual meaning for reading comprehension, 5- write difficult words, meaning and use them in the context, 6- prepare a presentation and share with the class orally,

Strategies

1-I asked the learner (read-write & audio-visual category) to read more and more because it is a known fact that attention deficit disorder is noticed

in reading the most, 2- I motivated them read aloud, jot down difficult words and consult dictionary meaning, sounds and usage, 3- I encouraged them to write out the words again and again, and practice as much as possible. 4- reinforced them to watch some online presentations of teachers and note down important words, 5- told them about the online authentic material related to the topic in the class, especially at home, 6- online dictionaries may be useful to check sounds, meanings and usage of the words.

Home Assignment: the tasks will be chosen and assigned that can facilitate learners to develop self-learning habits and skill development. Integration of technology will be an added advantage for listening, but more reading and writing practice need to be well incorporated.