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ПРОФЕССИОНАЛЬНОЕ ОБРАЗОВАНИЕ

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THE IMPACT OF PRACTICAL ASPECTS OF COMMUNICATION AND THINKING SKILLS FORMATION ON IMPROVING SELF-MANAGEMENT SKILLS IN UNIVERSITY STUDENTS

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Abstract. *Introduction.* The universities around the world attach great importance to acquiring self-management skills for students while training at the university. Recent studies have proven that these skills have a major role in the development of human personality and academic competencies. Communication and thinking skills are considered to be one of the most important skills that have become taught and have been included in the curricula in almost all Saudi universities. This process involves both theoretical and practical aspects, aiming to provide the student with the necessary knowledge to deal with the other, to use new technologies, to be able to think positively, and to solve problems.

The aim of the present research is to assess the impact of communication and thinking skills formation on the development of self-management skills among male and female students of the preparatory year in Northern Border University (Arar, Saudi Arabia).

Methodology and research methods. In the course of the research, the survey method was applied. The survey received responses from 400 students of eight faculties from the Northern Border University (200 male and 200 female students). To draw comparisons between male and female students' perspectives, the Student's t-test was used. The research hypotheses were validated, and the obtained data were statistically processed.

Results. The survey results indicate that there is a substantial difference in male and female student perspectives regarding the impact of communication and thinking skills. It was found out that male students had a much more

positive perspective while considering its impact on self-development, on the development of successful social circles, and the ability to teamwork. On the other hand, according to the female students, the development of communication and thinking skills has a positive impact on problem-solving ability, mental ability, intellectual development, creative thinking, and practical life application or life realism of students.

Scientific novelty. The present study confirms the importance of the implication of academic programmes aimed at students' self-development; as such training programmes allow students to cope with the challenges of the era of technology and remote communication. In addition to training programmes directed to positive thinking in the light of the challenges facing the world such as terrorism, extremist ideology, and racism, this study comes as an important step towards enhancing self-development skills in the field of communication and human reasoning for undergraduate students.

Practical significance. The authors formulated the recommendations to reform the system of particular educational services, to improve their quality due to the fastest, synchronous implementation of technological innovations and modern equipment, and to support teachers' competencies at the proper level. The importance of media education development actualises the creation of academic programmes at universities for the training of qualified teachers in the field of specific education, especially for countries, which do not have the same experience of training, since media education is becoming compulsory in the contemporary world, increasingly affecting the formation of individuals, culture, and society. Several proposals have been made to promote further research in this direction.

Keywords: practical aspects, communication skills, thinking skills, higher education, self-development skills, self-management skills.

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ВЛИЯНИЕ ПРАКТИЧЕСКИХ АСПЕКТОВ ФОРМИРОВАНИЯ НАВЫКОВ КОММУНИКАЦИИ И МЫШЛЕНИЯ НА РАЗВИТИЕ НАВЫКОВ САМОУПРАВЛЕНИЯ У СТУДЕНТОВ ВУЗА

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Аннотация. *Введение.* Университеты во всем мире придают большое значение приобретению студентами навыков самоуправления в период вузовского обучения. Многие исследования доказали, что эти навыки играют важную роль в личностном развитии и повышении академической компетентности. Одними из наиболее значимых считаются также навыки общения и мышления, поэтому овладение ими предусмотрено в содержании учебных программ практически во всех университетах Саудовской Аравии. Этот процесс включает теоретические и практические аспекты и направлен на то, чтобы дать студентам знания, необходимые для общения с другими людьми, использования инновационных технологий и развития способностей к позитивному мышлению и решению проблем.

Цель настоящего исследования – оценить, как влияет выработка практических навыков общения и мышления на развитие навыков самоуправления у студентов мужского и женского пола подготовительного года Северного пограничного университета (Арар, Саудовская Аравия).

Методология и методы исследования. В ходе исследования был использован метод анкетирования. В опросе приняли участие 400 студентов восьми факультетов Северного пограничного университета (по 200 человек мужского и женского пола). Сравнение взглядов юношей и девушек осуществлялось с помощью t-критерия Стьюдента. Гипотезы исследования были проверены, полученные данные статистически обработаны.

Результаты. Результаты опроса указывают на существенную разницу во взглядах обучающихся мужского и женского пола на влияние коммуникативных и мыслительных навыков. Юноши назвали более существенные аспекты, отметив значимость этих навыков для саморазвития, расширения круга общения и обретения способности к командной работе. По мнению девушек, наличие навыков общения и мышления положительно сказывается на умении решать проблемы, умственных способностях, интеллектуальном развитии, творческом мышлении, практической деятельности.

Научная новизна. Исследование подтвердило важность академических программ, направленных на саморазвитие студентов, а также востребованность программ обучения, которые позволяют справиться с вызовами

эпохи технологий и дистанционного взаимодействия. В дополнение к обучающим программам, способствующим формированию позитивного мышления в свете стоящих перед миром проблем терроризма, экстремистской идеологии и расизма, данное исследование является важным шагом на пути к выработыванию навыков саморазвития в области коммуникаций и мышления у студентов подготовительного года.

Практическая значимость. Авторами сформулированы рекомендации по реформированию системы конкретных образовательных услуг, повышению их качества за счет максимально быстрого, синхронного внедрения технологических инноваций и современного оборудования, а также поддержки компетенций учителей на должном уровне. Важность развития медиаобразования, которое становится обязательным в современном мире и всё больше влияет на формирование личности, культуры и общества, актуализирует необходимость создания академических программ для подготовки в университетах квалифицированных преподавателей в названной области, особенно для стран, которые не имеют должного опыта обучения. В статье обозначены пути дальнейших исследований в этом направлении.

Ключевые слова: практические аспекты, навыки коммуникации, навыки мышления, высшее образование, навыки саморазвития, навыки самоуправления.

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Introduction

The importance of communication and thinking skills development in higher education

The word communication has been derived from the Latin term 'communis' which in general means common. Thus, to communicate indicated to make it common or make known. The basic essence of communication involves the sharing of information [1]. As mentioned by [2] communication can be described as the process of expressing, receiving, and understanding messages that contain information, feelings, and ideas. In the present-day world, the development of any country depends on how well its universities are playing their role in producing competent graduates in different fields by focusing not only on academic achievement but also on generic skill or soft skill development, which is imperative in the global market. The nature of communication skills that are required among higher education students is unique in many regards. Communication skills form the foundation of effective speaking, writing, and learning that forms

the bedrock for the overall development of students. Further, the development of communication skills exposes students to conceptual skills like concord, ambiguity, and sentence patterns [3].

Communication skills in the study conducted by [4] must be prioritised over all else in universities since they are especially important in the job-seeking process. Since most companies hiring young graduates test them based on the communication skills, they present during the interview process, it becomes the responsibility of the universities to ensure that their students are well equipped with the ability to communicate clearly. Thinking skills on the other hand also form an important element while cultivating the students. Most of the higher education institutions and educators agree that it is essential to develop critical thinking skills among students while they are still engaged in academic learning since it enables them to engage in purposeful and self-regulatory judgments. This development of the thinking skills among the students helps them to effectively evaluate the arguments of others and their own and find the loopholes in them, thus letting them solve the conflicts and reaching well-reasoned solutions to these problems [5]. As mentioned by [6], developing critical thinking skills among students enables them to be inquisitive, well-informed, open-minded, flexible in his or her behaviour, fair-minded, honest, while facing personal biases, prudent in making judgments, willing to reconsider, seek relevant information and be reasonable in assessing people or situations.

Impact of the skills on self-efficacy, self-development, personal and intellectual abilities

Communication and thinking skills are crucial for any individual when it comes to dealing with people in day-to-day activities [7]. It is necessary to ensure that higher education students are trained with the right tools so that they can acquire communication and thinking skills as they progress through their academic life. Communication and thinking skills are further important for students to cope up with the rapidly changing world and to create the necessary impact on self-efficacy, self-development, and personal and intellectual abilities [8].

Communication and thinking skills tend to have a major impact on one's self-efficacy [9]. Self-efficacy can be defined as people's judgment regarding their capabilities to produce the designated performance level [10]. In the academic setting, self-efficacy can be defined as a student's belief in his/her ability to be able to do a specified learning task [11]. Communication skill forms an important element that is required by humans to adapt to the external environment. Through communication, students can find opportunities through which they can reveal, share, and evaluate the concepts and ideas they have in mind. On the other hand, thinking skills enable them to focus on mental activities, critically evaluate information, and form logic and reason out of it [12]. Thus, communication and thinking skills help students in establishing control over their functionality, helping them to gain confidence in their capabilities and increasing their self-efficacy [13]. The development of communication skills and thinking skills has a major impact on the self-development and personal and intellectual abilities of the students. By developing the ability to communicate

one's thoughts properly and by critically thinking on them before presenting them enables them to develop the positive attitude, bring enthusiasm for their career planning, take responsibility of their behaviour rather than blaming others, builds their self-confidence, enables personal time management which eventually leads to stress tolerance [14].

Saudi Arabia's higher education industry

Saudi Arabia's education industry is complex, consisting of private and public players offering courses in many disciplines and languages for students in successive stages of university education. It receives a substantial amount of government funding each year, currently being the second largest government funding receiver in the country [15]. However, it faces certain challenges in meeting dynamic consumer demand in terms of quality and quantity. The demand for higher education is seen to be greater than the capacity of the public sector and, therefore, it is fulfilled jointly by the private and public sector and offers higher quality education concerning teaching, learning, communication, thinking skills, and other extracurricular activities. The higher education sector has been seen to concentrate on improving the employability of graduates because of the nature of the sector since they emphasise practical class assignments and offer internships to prepare the graduates for the labour market [16]. This is crucial to prepare young Saudi graduates in the skills and knowledge demanded by the labour market [17]. Therefore, the education sector needs to prepare the graduates for the job market by inculcating the appropriate behaviour, attitude, values as well as beliefs in the graduates. Also, they are expected to possess the obligatory skills of teamwork, co-operation, decision-making, self-control as well as the magnitude of thinking skills and communication [18].

Northern Border University is one of Saudi Arabia's emerging universities which was established in 2007 and is located in Arar, Saudi Arabia. It is a medium-sized co-educational institution having an enrollment of 7500 students and is officially accredited by the Ministry of Education, Saudi Arabia. It has 11 colleges that offer different courses and academic programmes. This study aims to identify the impact of teaching the practical aspects of communication skills and thinking skills in the preparatory year on the development of self-management skills among the students of the Northern Border University. In this regard, the objectives of this study are as follows:

- To determine the difference in perspectives of male and female students regarding the impact of communication skills and thinking skills imparted in the university on their self-development.
- To determine the difference in perspectives of male and female students regarding the impact of communication skills and thinking skills imparted in the university on their problem-solving skills.
- To determine the difference in perspectives of male and female students regarding the impact of communication skills and thinking skills imparted in the university on their decision-making skills.
- To determine the difference in perspectives of male and female students regarding the impact of practical aspects of communication and thinking skills on their mental ability, intellectual development, and creative thinking skills.

- To determine the difference in perspectives of male and female students regarding the impact of practical aspects of communication and thinking skills on their practical life application or life realism.

Literature Review

Strategies and methods of teachers for imparting communication and thinking skills in higher education

Higher education institutions that are involved in producing graduates in various fields are required to be dynamic and change their teaching and operational processes according to the needs of the industry. During this process, they need to focus not only on academic skills but also on soft skills development of students, such as communication and thinking skills to prepare them to compete in the job market [19]. The present section first reviews some of the methods and strategies that are commonly by teachers and higher education institutions to improve communication and thinking skills among the students. To develop communication skills, the role of the teacher is very important [20]. Thus, it becomes crucial for the teachers to remain updated with the latest teaching tools that they can use while imparting communication skills among the students. The current world of advancements in technology and innovations has opened a multitude of innovative teaching methodologies aimed at increasing the inquisitiveness and ingenuity of higher education students. Some of these innovative teaching methods include the employment of smart gadgets performing crucial tasks such as teaching, preparation of question papers, assessment of student's conduct, and providing regular feedback. Among these, the major innovations seen in recent years concerning teaching and instructional methods are discussed below:

- **Discussion method:** One of the earliest definitions of the term 'discussion' was provided by O'Brien, 1939 [21], who referred to it as a process that involves face-to-face interaction among two or more participants where they share their ideas and perspectives about a topic. Under this approach teachers usually act as moderators. This approach helps the students to think critically about the topic and develop their communication skills rather than just memorising the facts [22].

- **Role-play method:** Role-play refers to changing one's behaviour to assume another, often fictitious role [23]. By introducing the role-play method in the classroom setting, a teacher expounds on how the behaviour of one individual affects the behaviour of others. According to [24], acting techniques such as creative drama and role-play have been used to acquire the self-development skills of university students, develop their ability to communicate effectively, develop thinking abilities, improve self-image, and accept others.

- **Demonstration method:** This can be considered as another effective way through which students can enhance their communication skills. Under this method, the teacher usually makes use of visuals to teach a concept, such as objects, images, or live models [25, 26].

- **Group work method:** In this method, students work in on assignments and tasks in groups, with each member communicating their inputs and ideas

with other members to build superior communication skills and construct new understandings [27]. Language is an important part of this strategy. This method promotes socialisation along with boosting academic achievement [28, 29].

Impact of communication and thinking skills at the university level

Communication and thinking skills are regarded as being very important for improving the soft skills needs of the students but besides these skills, other skills like the skill of facing the audience and speaking tactfully, team management, presentation skills are equally important. The students are required to possess social skills like effective communication, originality, problem-solving, logical thinking, mediation, flexibility, change-readiness, and listening skills. Communication and thinking skills help in developing leadership qualities within a person and improve the development of one's personality. The major impact of communication and thinking skills on students is described below:

- **Self-development:** Self-development refers to the development of individual characteristics of the person such as their behaviour, attitude, mindset, and the way of perceiving things and seeing the world [14]. Effective communication and thinking skills play a crucial role in honing oneself, as they allow an individual to better express themselves [30]. Moreover, thinking skills enable differentiating between wrong and right. Together, thinking and communication skills beget self-development that enables an individual to develop better relationships with others, enriching their creativity, imagination, willingness to act, reinforces academic, emotional, and interpersonal objectives, and helps to understand another individual [31].

- **Problem-solving:** Thinking skills enable an individual to determine the logical structure and meaning of the expression. The development of thinking skills among higher education students enables them to determine what views to accept, determining what to do, and in making the best judgment based on logic, evidence, and criteria, thus leading to improve their problem-solving ability [32, 33]. On the other hand, communication skills involve the dynamic and effective exchange of information among the participants [1].

- **Decision making:** Decision making, and problem-solving ability form the vital aspect that is demanded by the companies and corporate firms within young graduates. Communication and thinking skills form a major enabler of the decision-making ability of an individual [34]. Through effective communication skills, an individual is completely able to analyse what other person is saying, and the correct meaning of the context is understood that eventually helps in better decision making. Further, the thinking skills enable the person to properly analyse the situation, consider all the pros and cons that can arise due to the decision, how it will affect other people. Keeping all such aspects in mind enables a person to make better decisions [35].

- **Mental ability:** The development of communication and the thinking skills among the students have a significant impact on their mental ability [36, 37]. 'Mental ability' here refers to those skills that enable the individual to accomplish their daily activity life. A combination of communication and thinking skills leads to the development of mental skills involves the cognition

behavioural interplay and the individual ability which are related to memory, analytical capabilities, and concentration, and finally comes the intelligence which is facilitated by an individual brain [38].

• **Intellectual development:** Intellectual development focuses on the learning procedure to help students organise their minds, ideas, and thoughts to understand their environment better [39]. Critical thinking is self-directed and self-disciplined thinking based on logical reasoning and objectivity. Critical thinking improves the quality of thinking by taking charge of the structures inherent in thinking and imposing intellectual standards upon them. Critical thinking enables a person to analyse information and experiences logically and objectively [40]. It also helps to recognise factors like family values, peer, and media pressures that influence attitudes and behaviour. Research by Sternberg shows that for intellectual development, the three main processing skills which are required are analytical, creative skills, and practical skills [41]. It has been observed that a combination of various types of cognitive skills is significant for improving effective thinking, as students are required to analyse alternatives, solve a problem, and make efficient decisions.

• **Creative thinking:** Higher education institutions take significant steps to develop creative thinking skills among students. In this case, developing communication and thinking skills among the students play a major role in creative thinking abilities [42]. The development of creative thinking among the students gives rise to smoothness in the working, brings in flexibility, brings in originality in the ideas developed, helps to further explore the dimensions of the decision taken, and improves the student potential [41].

• **Application in practical life:** The development of communication and thinking skills has major implications when it comes to considering their impact on the real-life of the students. The development of both skills plays a major role in the successful career development of the students as well as a positive impact on their social interactions in society. Such skills are also highly sought by the recruiters while employing any fresh graduates. Incorporation of such skills among the students leads to overall personality development and induces a positive attitude among the students that help them at various stages in their life [43].

Conceptual framework

The following section presents the conceptual framework on which the present study is based. As shown in the diagram below, various strategies are adopted by the teachers to improve the communication and thinking skills among the students. To improve communication skills, the activities include discussion method, role-play method, demonstration method, group work, or by using apps. All these activities together have a positive impact on communication skills and thinking skills. This further leads to certain skill development that includes self-development, problem-solving, decision making, mental abilities, intellectual development, creative thinking, and the application of real life. Further, the diagram represents a certain aspect of each of the self-management skills that is the result of effective communication and thinking skills.

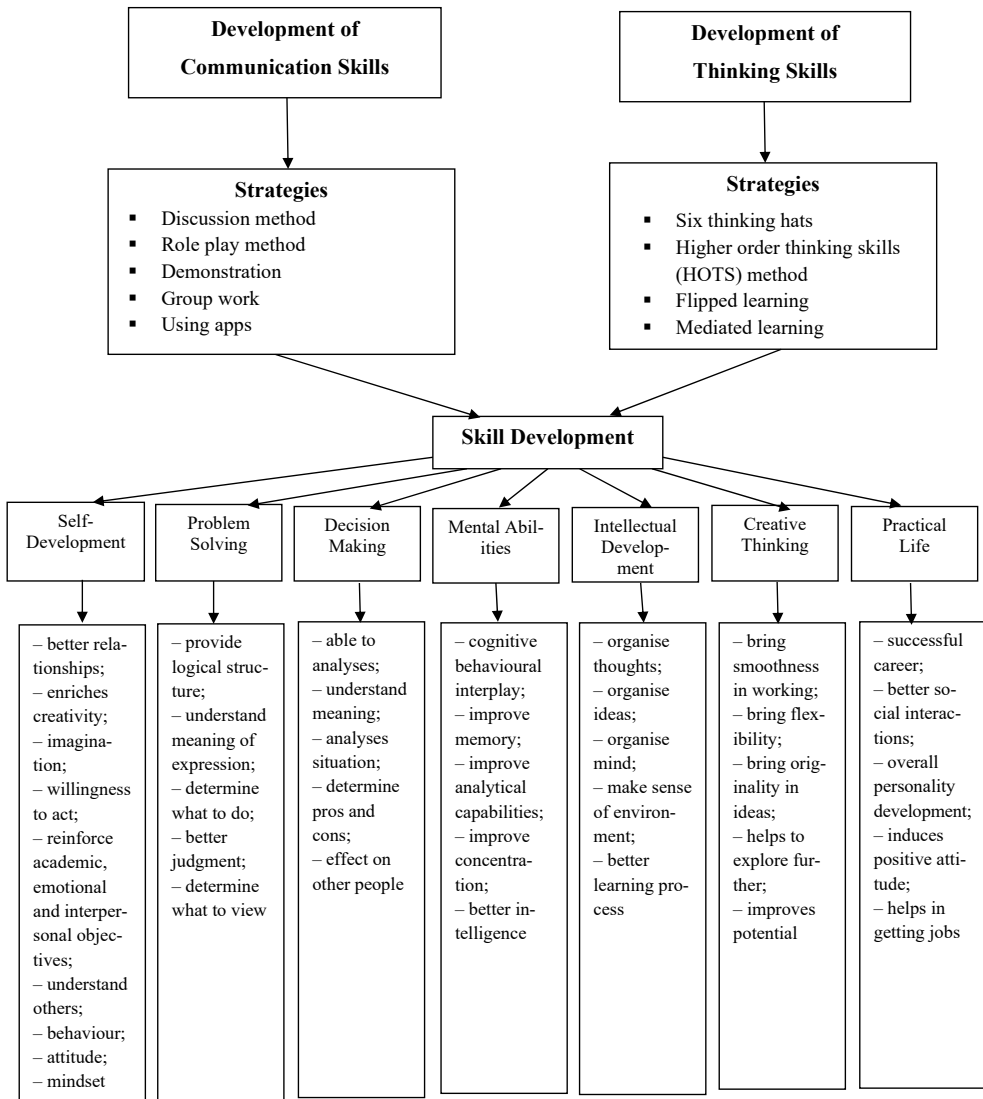


Fig. 1. Conceptual framework

Methodology

For the present study's primary research using the survey, the method was conducted. Therefore, the data type was quantitative and was collected among 400 students studying in the preparatory year of education from the Northern Border University in Arar, Saudi Arabia. The respondent group consisted of 200

male and 200 female students. The aim was to assess their perspectives on the practical application of communication and thinking skills and their role in the development of self-management skills imparted in their course. Along with the collection of the primary data, the secondary data was also collected that helped the researchers in guiding the formation of the conceptual framework, hypothesis, and identification of the gap in the previous literature and also supporting the information that was collected from the primary research.

A researcher must apply a specific sampling technique to estimate the extent to which the chosen sample size represents the intended population. In this case, the population of the study is the student population of the Kingdom of Saudi Arabia, specifically, higher education students. Therefore, the sampling technique chosen to represent this population was a simple random sampling method. Since this is a type of probability sampling, it ensured minimum bias in sample selection [44]. The sample size was 400, students from various faculties of the Northern Border University, which represented a majority portion of the total student population in preparatory years studying at the university at the time of data collection. For data collection, the university was first approached via an introductory email and phone call, wherein the intent of the study was explained. Thereafter, a suitable time and date were set for the data collection process. Before the data was collected, the researchers conducted an induction round with the students on the university campus wherein they have explained the purpose of conducting the survey, and their concerns were clarified. They were assured regarding the anonymity of their data, and that their data will be used only for this study. After the induction, the survey questionnaires were distributed in class, which took around two hours to fill and collect.

The questionnaire was close-ended and was designed to understand the perspective of the students regarding the strategies used to develop communication and thinking skills among the students. Further, it focused on how the development of these skills has impacted their skill development. Lastly, the questionnaire also focused on the challenges and threats arising from various strategies used.

After the data was collected, the researcher employed appropriate analysis tools for assessing the students' responses. The survey assessment methods comprised of frequency analysis and comparative analysis of male and female respondents on their perceptions regarding the impact of the communication and thinking skills on certain aspects such as self-development, problem-solving ability, dealing with different personalities, and develop the ability to teamwork, mental ability, intellectual development and creative thinking among the students and finally impact on the real life. T-test was employed for comparative analysis. The data collected from the respondents were in the raw form and were required to be processed and analysed to draw conclusions and generalisations. Therefore, data were coded and processed in SPSS software using descriptive and inferential analysis. The descriptive statistics aided in summarising the basic information contained in the data, describing the general features of the population. To this effect, the following hypotheses were formed and tested in SPSS:

H01: There is no significant difference in the perspective of male and female students regarding the impact of practical aspects of communication and thinking skills on the self-development of the students.

H02: There is no significant difference in the perspective of male and female students regarding the impact of practical aspects of communication and thinking skills on the problem-solving ability of the students.

H03: There is no significant difference in the perspective of male and female students regarding the impact of practical aspects of communication and thinking skills on students' ability to deal with different personalities and developing teamwork skills.

H04: There is no significant difference in the perspective of male and female students regarding the impact of practical aspects of communication and thinking skills on mental ability, intellectual development, and creative thinking skills of the students.

H05: There is no significant difference in perspectives of male and female students regarding the impact of practical aspects of communication and thinking skills on the practical life application or life realism of students.

Data analysis

The first part of this section describes the demographic profile and the general background of the respondents in the form of the graphs and pie charts, followed by inferential analysis using T-Test, which enables the researchers to provide the comparison among the male and the female students.

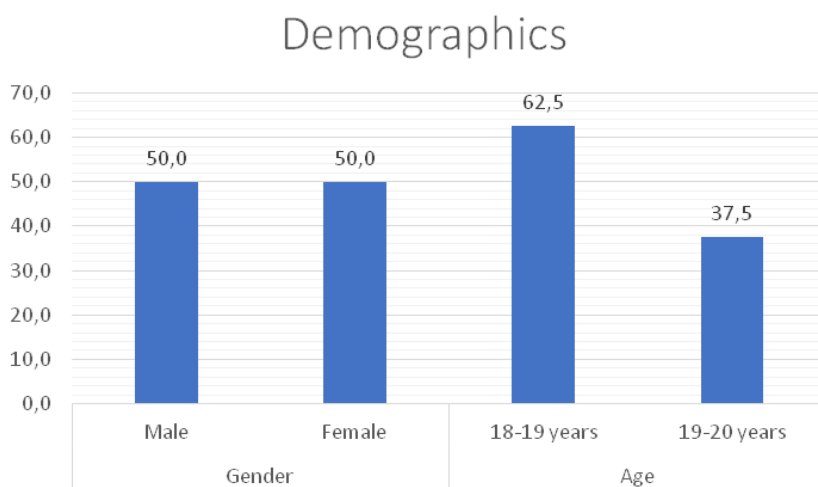


Fig. 2. Demographic profile of respondents, %

As shown in the diagram above, an equal number of male and female respondents were included in the present study, i.e. 50% of the respondents were

female and 50% of them were male students. Further focusing on the age group of the respondents it was found that most of the respondents belonged to the age group of 18–20 years (56%).

Further, Northern Border University has 11 major academic colleges. The questionnaire tool for the study has been applied to eight colleges of the university. It was found that the majority of the respondents belonged to the Faculty of Education and Arts (18%). The second-highest number of respondents belonged to the College of Business Administration (16%). Further, 15% of the respondents were from the College of Science. The figure below represents this result in the other faculties of the university.

Colleges and academic disciplines

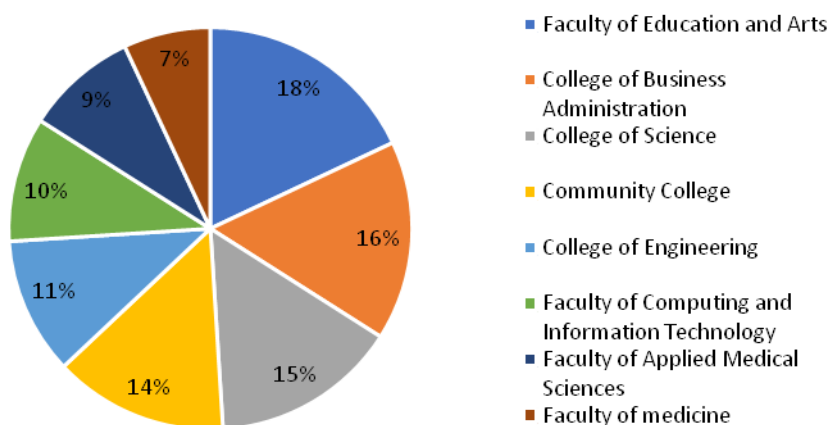


Fig. 3. Colleges and academic disciplines of respondents

Further, students were asked questions about the implementation of methods to cultivate communication and thinking skills in students of the university. 98% of the respondents said 'yes' on being asked if their institution has taken steps towards improving communication and thinking skills among students. Further, almost all the respondents were part of such programmes (99%). The students were then asked about specific methods that were employed in class to improve their communication skills. To this, according to them, the most famous of all them was the role-play method which was adopted by 25% of the teachers. The second most effective strategy was the discussion method (23%). The third highest was the demonstration method (21%). They were then asked about the benefits that arise due to improving their communication and thinking skills, to which they professed that these skills lead to better decision-making ability among the students (20%), improved mental ability (18%), and

problem-solving capability (16%). Finally, their perception of challenges arising from the adoption of these modern strategies instead of traditional teaching methods was determined. It was found that the adoption of strategies for improving communication and thinking skills leads to increased time investment (27%) and the difficulty of teachers in keeping track of their coursework progress (19%).

Inferential analysis

The inferential analysis section helps to fulfil the aim of the study and establishes the relationship between various variables:

Communication and thinking skill and self-development

The following analysis is based on determining the perspective of male and female students regarding the impact of the communication and thinking skills (independent variable) on the self-development (dependent variable) of students. The coding of elements forming these variables is represented in Table 1 of the Appendix (1). The hypothesis formulated to consider the effectiveness of the practical side of the communication skills and thinking skills on the self-development of the male and female students is as follows:

H01: There is no significant difference in the perspective of male and female students regarding the impact of practical aspects of communication and thinking skills on the self-development of the students.

Table 1 shows the descriptive statistics, i.e. the mean, standard division, and standard error for the results obtained from the male and the female students.

Table 1

Descriptive statistics of hypothesis 1

| Gender | | Mean | Std. deviation | Std. error mean |
|--------|---|--------|----------------|-----------------|
| 1 | | 2 | 3 | 4 |
| A1 | M | 3.8500 | 1.11972 | .07918 |
| | F | 3.2050 | 1.36466 | .09650 |
| A2 | M | 3.9300 | 1.09135 | .07717 |
| | F | 3.4700 | 1.41034 | .09973 |
| A3 | M | 3.7400 | 1.13084 | .07996 |
| | F | 3.1300 | 1.49138 | .10546 |
| A4 | M | 3.8350 | 1.20625 | .08530 |
| | F | 3.5800 | 1.46091 | .10330 |
| A5 | M | 4.0700 | 1.09135 | .07717 |
| | F | 3.5200 | 1.56584 | .11072 |
| A6 | M | 3.7300 | 1.28661 | .09098 |
| | F | 2.9350 | 1.48722 | .10516 |

| 1 | | 2 | 3 | 4 |
|----|---|--------|---------|--------|
| A7 | M | 3.8050 | 1.16782 | .08258 |
| | F | 3.3900 | 1.49300 | .10557 |
| A8 | M | 3.9750 | 1.10475 | .07812 |
| | F | 3.6700 | 1.40032 | .09902 |
| A9 | M | 3.7600 | 1.12192 | .07933 |
| | F | 3.3650 | 1.31163 | .09275 |

As shown in Table 1 above for all the aspects ranging from A1 to A9 the mean value of the male responses has been greater than the female responses, i.e. (A1 – 3.8500 > 3.2050, A2 – 3.9300 > 3.4700, A3 – 3.7400 > 3.1300, A4 – 3.8350 > 3.5800, A5 – 4.0700.3.5200, A6 – 3.7300 > 2.9350, A7 – 3.8050 > 3.3900, A8 – 3.9750 > 3.6700, A9 – 3.7600 > 3.3650) which means that on an average male student have more positive perspective regarding the impact of the communication and thinking skills on the self-development while the female responses were quite neutral regarding the impact. Further considering the value of standard deviation which represents fluctuations in the responses, it was found that it was less in male students as compared to the female students, i.e. (A1 – 1.11972 < 1.36466, A2 – 1.09135 < 1.41034, A3 – 1.13084 < 1.49138, A4 – 1.20625 < 1.46091, A5 – 1.09135 < 1.56584, A6 – 1.28661 < 1.48722, A7 – 1.16782 < 1.49300, A8 – 1.10475 < 1.40032 A9 – 1.12192 < 1.31163), which means that there is more variability in the female students responses than male student responses. Next, the std. error mean score represented the chances of error in the responses which were found to be more in the female responses than in the male responses for all the aspects varying from A1-A9 since there is more variability in the female responses thus the chances of biasedness also increase. However, to derive the significance of the testing, Levene’s Test for Equality of Variances and T-test for equality of mean was performed, the result of which are represented in Table 2.

Table 2

T-test results for hypothesis 1

| Levene’s Test for Equality of Variances | | | T-Test for Equality of Means | | | | |
|---|-----------------------------|--|------------------------------|------|-------|---------|--------------------|
| 1 | | | 2 | 3 | 4 | 5 | 6 |
| | | | F | Sig. | t | df | Sig. (2-tailed) |
| A1 | Equal variances assumed | | 27.136 | .000 | 5.167 | 398 | .000 |
| | Equal variances not assumed | | | | 5.167 | 383.379 | .000 |
| A2 | Equal variances assumed | | 42.721 | .000 | 3.648 | 398 | .000 |
| | Equal variances not assumed | | | | 3.648 | 374.424 | .000 |
| A3 | Equal variances assumed | | 55.047 | .000 | 4.609 | 398 | .000 |
| | Equal variances not assumed | | | | 4.609 | 370.978 | .000 |
| A4 | Equal variances assumed | | 20.355 | .000 | 1.903 | 398 | 0.58 |
| | Equal variances not assumed | | | | 1.903 | 384.241 | 0.58 |

| | 1 | 2 | 3 | 4 | 5 | 6 |
|----|-----------------------------|--------|------|-------|---------|------|
| A5 | Equal variances assumed | 91.460 | .000 | 4.075 | 398 | .000 |
| | Equal variances not assumed | | | 4.075 | 355.426 | .000 |
| A6 | Equal variances assumed | 24.846 | .000 | 5.717 | 398 | .000 |
| | Equal variances not assumed | | | 5.717 | 389.972 | .000 |
| A7 | Equal variances assumed | 41.428 | .000 | 3.096 | 398 | .002 |
| | Equal variances not assumed | | | 3.096 | 376.182 | .002 |
| A8 | Equal variances assumed | 31.224 | .000 | 2.418 | 398 | 0.16 |
| | Equal variances not assumed | | | 2.418 | 377.549 | 0.16 |
| A9 | Equal variances assumed | 21.129 | .000 | 3.236 | 398 | .001 |
| | Equal variances not assumed | | | 3.236 | 388.665 | .001 |

Since the P-value for all aspects ranging from A1-A9 is .000 which is less than the significance level of the study that is 0.05, there is equal variance or perspective variability between male and female students. Next, the T-test for equality of means was applied and it was found that the P-value for all aspects at the level of equal variance assumed was less than 0.05, except for A4 (Improves student's willingness to act) and A8 (Brings in positive attitude among the students). Thus, the null hypothesis of no significant difference in perspective of male and female students regarding the impact of practical aspects of communication and thinking skills on the self-development of the students is rejected, and it can be concluded that there exist differences in the perspectives of male and female students regarding the impact of communication and thinking skills on self-development.

Communication and thinking skills and problem-solving ability

The next section of the survey was aimed at determining the perspectives of male and female respondents regarding the impact of thinking and communication skills (independent variable) on their problem-solving abilities (dependent variable). The coding of elements forming these variables is represented in Table 2 of the Appendix.

The hypothesis formulated to consider the effectiveness of the practical side of the communication skills and thinking skills on the problem-solving ability of the male and female students is as follows:

H02: There is no significant difference in the perspective of male and female students regarding the impact of practical aspects of communication and thinking skills on the problem-solving ability of the students.

Table 3 shows the descriptive statistics for the results obtained from male and female students.

Table 3

Descriptive statistics of hypothesis 2

| Gender | Mean | Std. deviation | Std. error mean | |
|--------|------|----------------|-----------------|--------|
| 1 | 2 | 3 | 4 | |
| B1 | M | 3.5750 | 1.63639 | .11571 |
| | F | 4.1500 | 1.11071 | .07854 |

| 1 | | 2 | 3 | 4 |
|----|---|--------|---------|--------|
| B2 | M | 1.6650 | 1.25725 | .08890 |
| | F | 2.9750 | 1.36517 | .09653 |
| B3 | M | 3.2600 | 1.57952 | .11169 |
| | F | 3.6550 | 1.40207 | .09914 |
| B4 | M | 3.2100 | 1.44093 | .10189 |
| | F | 2.9300 | 1.48192 | .10479 |
| B5 | M | 3.6100 | 1.39558 | .09868 |
| | F | 3.5200 | 1.50363 | .10632 |

For the aspects ranging from B1 to B3 (B1-3.5750<4.1500, B2-1.66650<2.9750, B3- 3.2600<3.6550) the mean value of the female responses was greater than the male responses which considering for B4 and B5 (B4-3.2100>2.9300, B5- 3.6100>3.5200) it was greater for male responses. This means that on average, female students had a much more positive perspective regarding the impact of communication and thinking skills on their problem-solving abilities.

Further, considering the value of standard deviation which represents the fluctuation level in the male and female responses, it was found that it was less in male students as compared to the female students (B1 – 1.63639 > 1.11071, B2 – 1.25725 < 1.36517, B3 – 1.57952 > 1.40207, B4 – 1.44093 < 1.48192, B5 – 1.39558 < 1.50363). Next, the standard error of the mean score represented the chances of error in the responses which were found to be more in the females as compared to the males since there is more variability in the former's responses. This eventually increases the chances of bias among the female responses. However, to determine the significance level, Levene's Test for Equality of Variances and T-test for equality of mean was performed. The results are represented in the table below.

Table 4

T-Test results of hypothesis 2

| Levene's Test for Equality of Variances | | | T-Test for Equality of Means | | | | |
|---|-----------------------------|--|------------------------------|------|--------|---------|--------------------|
| | | | F | Sig. | t | df | Sig. (2-tailed) |
| B1 | Equal variances assumed | | 62.141 | .000 | -4.112 | 398 | .000 |
| | Equal variances not assumed | | | | -4.112 | 350.257 | .000 |
| B2 | Equal variances assumed | | 12.411 | .000 | -9.982 | 398 | .000 |
| | Equal variances not assumed | | | | -9.982 | 395.331 | .000 |
| B3 | Equal variances assumed | | 8.040 | .005 | -2.645 | 398 | .008 |
| | Equal variances not assumed | | | | -2.645 | 392.479 | .008 |
| B4 | Equal variances assumed | | .868 | .352 | 1.916 | 398 | .056 |
| | Equal variances not assumed | | | | 1.916 | 397.687 | .056 |
| B5 | Equal variances assumed | | 3.690 | .055 | .620 | 398 | .535 |
| | Equal variances not assumed | | | | .620 | 395.807 | .535 |

Levene's Test for Equality of Variances revealed the P-value for B1, B2, and B3 to be less than the significance level of the study, which is 0.05, there is an equal variance for them. However, for B4 and B5 the p-value is greater than the significance level of 0.05. Therefore, the equal variance is not assumed in these cases. Results of the t-test for equality of means revealed P-value for B1, B2, and B3 to be less than the significance value of 0.05 at the level of equal variance assumed. However, for B4 and B5 the P value was greater than 0.05. Since for many elements the P-value was less than 0.05, the null hypothesis that there is no significant difference in perspective of male and female students regarding the impact of practical aspects of communication and thinking skills on the problem-solving ability of the students is rejected, indicating that male and female respondents perceive the impact of communication and thinking skills on their problem-solving abilities differently.

Communication and thinking skills and dealing with different personalities and develop the ability to teamwork

The next section of the study is aimed to determine the students' perspectives on the impact of thinking and communication skills (independent variable) on dealing with different personalities and developing teamwork skills (dependent variable). The coding of the variables is represented in Table 3 of the Appendix. The hypothesis framed in this regard is as follows.

H03: There is no significant difference in the perspective of male and female students regarding the impact of practical aspects of communication and thinking skills on students' ability to deal with different personalities and developing teamwork skills.

Table 5 shows the descriptive statistics for the results obtained from male and female students.

Table 5

Descriptive statistics of hypothesis 3

| Gender | | Mean | Std. deviation | Std. error mean |
|--------|---|--------|----------------|-----------------|
| 1 | | 2 | 3 | 4 |
| C1 | M | 3.3300 | 1.19088 | .08421 |
| | F | 3.5850 | 1.26522 | .08946 |
| C2 | M | 3.1500 | 1.47934 | .10461 |
| | F | 3.7900 | 1.23023 | .08699 |
| C3 | M | 3.2900 | 1.31321 | .09286 |
| | F | 3.8500 | 1.18936 | .08410 |
| C4 | M | 3.1150 | 1.26879 | .08972 |
| | F | 3.4050 | 1.52070 | .10753 |
| C5 | M | 3.5600 | 1.21812 | .08613 |
| | F | 3.0550 | 1.43607 | .10155 |
| C6 | M | 3.6150 | 1.15475 | .08165 |
| | F | 3.3300 | 1.31520 | .09300 |
| C7 | M | 3.7900 | 1.16304 | .08224 |
| | F | 3.3000 | 1.38912 | .09823 |
| C8 | M | 3.8650 | 1.20166 | .08497 |
| | F | 3.1000 | 1.34874 | .09537 |

| 1 | | 2 | 3 | 4 |
|-----|---|--------|---------|--------|
| C9 | M | 3.6650 | 1.17887 | .08336 |
| | F | 3.3150 | 1.40558 | .09939 |
| C10 | M | 3.7450 | 1.20300 | .08507 |
| | F | 3.4700 | 1.37058 | .09691 |
| C11 | M | 3.5800 | 1.17495 | .08308 |
| | F | 3.2100 | 1.46171 | .10336 |

As shown in the table above in the majority of the cases, i.e. (C5, C6, C7, C8, C9, C10, and C11) the value of the mean score was greater for males responses than the female responses. This indicates that male students had a much more positive perspective than females. On the other hand, the females' responses were quite neutral.

Further considering the value of standard deviation which represents the fluctuation level in the male and female responses, it was found to be less among male students as compared to female students. Next, the standard error of the mean score represented the chances of error in the responses which were found to be more in the female responses since there is more variability in their data, representing more bias as well. Finally, Levene's Test for Equality of Variances and T-test for equality of mean was performed for determining the significance level. The result is represented in Table 6.

Table 6

T-Test results of hypothesis 3

| Levene's Test for Equality of Variances | | T-Test for Equality of Means | | | | |
|---|-----------------------------|------------------------------|------|--------|---------|--------------------|
| 1 | | 2 | 3 | 4 | 5 | 6 |
| | | F | Sig. | t | df | Sig. (2-tailed) |
| C1 | Equal variances assumed | .036 | .850 | -2.076 | 398 | .039 |
| | Equal variances not assumed | | | -2.076 | 396.549 | .039 |
| C2 | Equal variances assumed | 29.377 | .000 | -4.704 | 398 | .000 |
| | Equal variances not assumed | | | -4.704 | 385.194 | .000 |
| C3 | Equal variances assumed | 11.047 | .001 | -4.470 | 398 | .000 |
| | Equal variances not assumed | | | -4.470 | 394.157 | .000 |
| C4 | Equal variances assumed | 28.541 | .000 | -2.071 | 398 | .039 |
| | Equal variances not assumed | | | -2.071 | 385.623 | .039 |
| C5 | Equal variances assumed | 22.375 | .000 | 3.793 | 398 | .000 |
| | Equal variances not assumed | | | 3.793 | 387.684 | .000 |
| C6 | Equal variances assumed | 9.382 | .002 | 2.303 | 398 | .022 |
| | Equal variances not assumed | | | 2.303 | 391.448 | .022 |
| C7 | Equal variances assumed | 19.078 | .000 | 3.825 | 398 | .000 |
| | Equal variances not assumed | | | 3.825 | 386.070 | .000 |
| C8 | Equal variances assumed | 16.768 | .000 | 5.989 | 398 | .000 |
| | Equal variances not assumed | | | 5.989 | 392.809 | .000 |

| | 1 | 2 | 3 | 4 | 5 | 6 |
|-----|-----------------------------|--------|------|-------|---------|------|
| C9 | Equal variances assumed | 14.472 | .000 | 2.698 | 398 | .007 |
| | Equal variances not assumed | | | 2.698 | 386.291 | .007 |
| C10 | Equal variances assumed | 11.740 | .001 | 2.133 | 398 | .034 |
| | Equal variances not assumed | | | 2.133 | 391.417 | .034 |
| C11 | Equal variances assumed | 29.387 | .000 | 2.790 | 398 | .006 |
| | Equal variances not assumed | | | 2.790 | 380.419 | .006 |

Levene's Test for Equality of Variances reveals that the p-value for all variables is less than 0.05, except for C1. This means that for the majority of these cases there was equal variance. Further, the T-test for equality of means revealed that P-value for variables C2, C3, C5, C6, C7, C8, C9, and C11 was less than the significance value of 0.05 at the level of equal variance assumed. Therefore, the null hypothesis that there is no significant difference in perspectives of male and female students regarding the impact of practical aspects of communication and thinking skills on the students' ability to deal with different personalities and teamwork skills is rejected.

Communication and thinking skills and mental ability, intellectual development, and creative thinking skills

The next hypothesis proposed was to determine the differences in opinions of males and female respondents on the impact of communication and thinking skills (independent variable) on mental ability, intellectual development, and thinking skills (dependent variable) of students. The coding of elements consisting of these variables is represented in Table 4 of the Appendix. This hypothesis is as follows:

H04: There is no significant difference in the perspective of male and female students regarding the impact of practical aspects of communication and thinking skills on mental ability, intellectual development, and creative thinking skills of the students.

Table 7 shows the descriptive statistics for the results obtained from the male and female students:

Table 7

Descriptive statistics of hypothesis 4

| Gender | | Mean | Std. deviation | Std.error mean |
|--------|---|--------|----------------|----------------|
| 1 | | 2 | 3 | 4 |
| D1 | M | 3.6900 | 1.18784 | .08399 |
| | F | 3.2650 | 1.22977 | .08696 |
| D2 | M | 3.6150 | 1.22239 | .08644 |
| | F | 3.1000 | 1.46311 | .10346 |
| D3 | M | 3.8300 | 1.21593 | .08598 |
| | F | 3.2600 | 1.33842 | .09464 |
| D4 | M | 3.7700 | 1.18071 | .08349 |
| | F | 3.1150 | 1.26879 | .08972 |
| D5 | M | 3.3050 | 1.52103 | .10755 |
| | F | 3.5400 | 1.24747 | .08500 |

| 1 | | 2 | 3 | 4 |
|-----|---|--------|---------|--------|
| D6 | M | 3.0450 | 1.42235 | .10058 |
| | F | 3.6100 | 1.20213 | .08500 |
| D7 | M | 3.2600 | 1.30419 | .09222 |
| | F | 3.7100 | 1.25450 | .08871 |
| D8 | M | 3.4000 | 1.34874 | .09381 |
| | F | 3.7950 | 1.26530 | .08947 |
| D9 | M | 3.1700 | 1.32661 | .09381 |
| | F | 3.5950 | 1.21174 | .08568 |
| D10 | M | 3.2050 | 1.39019 | .09830 |
| | F | 3.6400 | 1.25630 | .08883 |
| D11 | M | 3.4950 | 1.34873 | .09537 |
| | F | 3.5450 | 1.16394 | .08230 |
| D12 | M | 3.2050 | 1.45034 | .10255 |
| | F | 3.7000 | 1.24811 | .08825 |
| D13 | M | 3.1550 | 1.48052 | .10469 |
| | F | 3.2950 | 1.51308 | .10699 |
| D14 | M | 2.9150 | 1.35905 | .09610 |
| | F | 3.0300 | 1.41034 | .09973 |
| D15 | M | 3.1000 | 1.30711 | .09243 |
| | F | 3.2850 | 1.30086 | .09198 |

As shown in the table above in the majority of the cases i.e. in D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15 the value of mean score was greater for the female responses than for males. This indicates that female students had a much more positive perspective regarding the impact of communication and thinking skills on mental ability, intellectual development, and thinking skills of students. On the other hand, the male responses were quite neutral. Further standard deviation values were less in female students as compared to the male students. The standard error of the mean score was found to be more in the male responses than females. However, to derive the significance of the testing, Levene's Test for Equality of Variances and T-test for equality of mean was performed, the results of which are represented in Table 8.

Table 8

T-test results of hypothesis 4

| Levene's Test for Equality of Variances | | T-Test for Equality of Means | | | | |
|---|-----------------------------|------------------------------|------|-------|---------|--------------------|
| 1 | | 2 | 3 | 4 | 5 | 6 |
| | | F | Sig. | t | df | Sig. (2-tailed) |
| D1 | Equal variances assumed | 2.725 | .100 | 3.515 | 398 | .000 |
| | Equal variances not assumed | | | 3.515 | 397.522 | .000 |
| D2 | Equal variances assumed | 30.795 | .000 | 3.820 | 398 | .000 |
| | Equal variances not assumed | | | 3.820 | 385.798 | .000 |

| | 1 | 2 | 3 | 4 | 5 | 6 |
|-----|-----------------------------|--------|------|--------|---------|------|
| D3 | Equal variances assumed | 10.545 | .001 | 4.458 | 398 | .000 |
| | Equal variances not assumed | | | 4.458 | 394.389 | .000 |
| D4 | Equal variances assumed | 2.341 | .127 | 5.345 | 398 | .000 |
| | Equal variances not assumed | | | 5.345 | 395.957 | .000 |
| D5 | Equal variances assumed | 33.093 | .000 | -1.689 | 398 | .092 |
| | Equal variances not assumed | | | -1.689 | 383.317 | .092 |
| D6 | Equal variances assumed | 21.639 | .000 | -4.291 | 398 | .000 |
| | Equal variances not assumed | | | -4.291 | 387.246 | .000 |
| D7 | Equal variances assumed | 3.245 | .072 | -3.571 | 398 | .000 |
| | Equal variances not assumed | | | -3.571 | 397.401 | .000 |
| D8 | Equal variances assumed | 4.305 | .039 | -3.021 | 398 | .003 |
| | Equal variances not assumed | | | -3.021 | 396.388 | .003 |
| D9 | Equal variances assumed | 6.990 | .009 | -3.345 | 398 | .001 |
| | Equal variances not assumed | | | -3.345 | 394.779 | .001 |
| D10 | Equal variances assumed | 6.929 | .009 | -3.283 | 398 | .001 |
| | Equal variances not assumed | | | -3.283 | 393.660 | .001 |
| D11 | Equal variances assumed | 8.172 | .004 | -.397 | 398 | .692 |
| | Equal variances not assumed | | | -.397 | 389.660 | .692 |
| D12 | Equal variances assumed | 16.174 | .000 | -3.659 | 398 | .000 |
| | Equal variances not assumed | | | -3.569 | 389.351 | .000 |
| D13 | Equal variances assumed | 1.045 | .307 | -.935 | 398 | .350 |
| | Equal variances not assumed | | | -.935 | 397.812 | .350 |
| D14 | Equal variances assumed | .816 | .367 | -.830 | 398 | .407 |
| | Equal variances not assumed | | | -.830 | 397.455 | .407 |
| D15 | Equal variances assumed | 1.035 | .310 | -1.419 | 398 | .157 |
| | Equal variances not assumed | | | -1.419 | 397.991 | .157 |

The Levene's test reveals the p-value for the variables at less than 0.05 for elements D2, D3, D5, D6, D9, D10, D11, D12. This means that for the majority of these cases there was equal variance. Further, the t-test for equality of means revealed that the P-Value for variables D1, D2, D3, D4, D6, D7, D8, D9, and D12 were less than the significance value of 0.05 at the level of equal variance assumed. Therefore, the *null hypothesis that there is no significant difference in perspectives of male and female students regarding the impact of practical aspects of communication and thinking skills on mental ability, intellectual development, and creative thinking skills among the students is rejected.*

Communication and thinking skills and practical life application or life realism of students

The final hypothesis aimed to determine the differences in perspectives of male and female students regarding the impact of the communication and thinking skills (independent variable) on practical life application (dependent variable) of students. The coding of elements in these variables is represented in Table 5 of the Appendix. The hypothesis is thus as follows:

H05: There is no significant difference in perspectives of male and female students regarding the impact of practical aspects of communication and thinking skills on the practical life application or life realism of students.

Table 9 demonstrates the descriptive statistics for the results obtained from male and female students.

Table 9

Descriptive statistics of hypothesis 5

| Gender | | Mean | Std.deviation | Std. error mean |
|--------|---|--------|---------------|-----------------|
| E1 | M | 3.3900 | 1.53940 | .10885 |
| | F | 3.5600 | 1.25069 | .08844 |
| E2 | M | 3.5600 | 1.47215 | .10410 |
| | F | 3.7500 | 1.32903 | .09398 |
| E3 | M | 3.5150 | 1.42828 | .10099 |
| | F | 3.7450 | 1.33374 | .09431 |
| E4 | M | 3.6100 | 1.44858 | .10243 |
| | F | 3.5550 | 1.32505 | .09370 |
| E5 | M | 3.7000 | 1.45277 | .10273 |
| | F | 3.7100 | 1.29394 | .09150 |

In the majority of the cases, i.e. in E2, E3, E5, the value of the mean score was greater for female respondents than for males, which indicates that female students had a much more positive perspective regarding the impact of communication and thinking skills on practical life application or life realism students. On the other hand, the male responses were quite neutral. Standard deviation values were less in female students as compared to male students. Next, the standard error of the mean score was found to be more in the male responses. Table 10 represents the results of Levene's Test for Equality of Variances, revealing the significance scores.

Table 10

T-Test results of hypothesis 5

| Levene's Test for Equality of Variances | | | T-Test for Equality of Means | | | |
|---|-----------------------------|--------|------------------------------|--------|---------|-----------------|
| | | F | Sig. | T | df | Sig. (2-tailed) |
| E1 | Equal variances assumed | 31.008 | .000 | -1.212 | 398 | .226 |
| | Equal variances not assumed | | | -1.212 | 381.984 | .226 |
| E2 | Equal variances assumed | 11.698 | .001 | -1.355 | 398 | .176 |
| | Equal variances not assumed | | | -1.355 | 393.908 | .176 |
| E3 | Equal variances assumed | 5.580 | .019 | -1.664 | 398 | .097 |
| | Equal variances not assumed | | | -1.664 | 396.148 | .097 |
| E4 | Equal variances assumed | 4.482 | .035 | .396 | 398 | .692 |
| | Equal variances not assumed | | | .396 | 394.879 | .692 |
| E5 | Equal variances assumed | 8.891 | .003 | -.073 | 398 | .942 |
| | Equal variances not assumed | | | -.073 | 392.781 | .942 |

The p-value for all the variables was less than 0.05, indicating that for the majority of these cases there was equal variance. Further, the T-test for equality of means revealed a p-value for many variables to be greater than the significance value of 0.05, therefore the null hypothesis proved that there is no significant difference in perspective of male and female students regarding the impact of practical aspects of communication and thinking skills on the practical life application or life realism students.

Conclusion

The purpose of the present study was to investigate the impact of teaching the practical aspects of the communication and thinking skills on the development of self-management skills among the students in the preparatory year of the Northern Border University. It was found out that various strategies are used for improving the communication and thinking skills among the students. For example, to improve the communication skills strategies such as discussion method, role-play method, demonstration method, group work method is used. On the other hand, to improve the thinking skills, strategies such as concept mapping, student-created content videos, gamification, flipped learning, mediated learning or higher-order thinking skills (HOTS) method can be used. Now, this development of communication and thinking skills tends to have a major effect on the self-management skills development of students.

It was further found that imparting communication and thinking skills among students has a positive impact on their self-development such as by providing them with a positive attitude and the way they perceive the things and helps them to differentiate between what is wrong and right. Additionally, it also enhances the problem-solving ability of students by enabling them to determine logical structure and meaning of expressions, thus helping them in practical life as well by letting them determine what views to accept, determining what to do, and in making the best judgment based on logic, evidence and criteria. Moreover, it was also found that enhancing communication and thinking skills enable them to deal with different personalities in a better manner and help them work in teams more cohesively. Furthermore, it tends to positively impact mental ability, intellectual development, and the creative thinking skills of the students. This helps students in their practical lives by improving their ability related to memory, analytical capabilities, and concentration. Also, in the real world, these skills have an impact on social interactions in society. Such skills are highly sought by the recruiters while employing any fresh graduates. Inculcation of such skills leads to overall personality development and induces a positive attitude among students that help them at various stages in their life.

The evidence from this study suggests that the inferential section considered the perspective of male and female students regarding the impact of communication and thinking skills on self-development, problem-solving ability, on dealing with a different personality, teamwork, mental ability, intellectual development, creative thinking, and on the practical life of the students. The findings of this research indicate that there is a significant difference in the opinion of

male and female students regarding the impact of communication and thinking skills. For example, the male students had a much more positive perspective while considering its impact on self-development, on dealing with different personalities and develop the ability to teamwork. According to the female students, the development of communication and thinking skills has a positive impact on problem-solving ability, mental ability, intellectual development, creative thinking, and practical life application or life realism of students.

Based on the findings of the current study, certain recommendations can be made:

- Since the development of communication and thinking skills tend to have many positive practical life implications. Hence, these skills should be taught as the main part of the curriculum from the very basic years of education to impart the self-development skills among the students from the beginning and not as the secondary subjects.

- Since it becomes difficult to determine the impact of teaching communication and thinking skills, thus in this case the approach of conducting longitudinal studies can be adopted which can guide the teachers while judging the students. Further, it could help in properly determining the impact of teaching communication and thinking skills.

- Further to develop the communication and thinking skills among the students, teachers should switch from the traditional way of teaching towards more modern ways such as including discussion method, role-play method, concept mapping, gamification, flipped learning, mediated learning, etc.

- Moreover, to develop communication and thinking skills among the students, they should not only be confined to school boundaries. For example, there should be frequent interschool debate competitions or on spot speaking challenges that eventually help in building communication and thinking skills.

References

1. Komba S. C. The perceived importance of communication skills courses among university students: The case of two universities in Tanzania. *African Journal of Teacher Education* [Internet]. 2016 [cited 2020 Feb 02]; 4 (2). Available from: <https://doi.org/10.21083/ajote.v4i2.3064>
2. Asemanyi A. A. An Assessment of Students' Performance in Communication Skills: A Case Study of the University of Education Winneba. *Journal of Education and Practice*. 2015; 6 (35): 1–7.
3. Ihmeideh F. M., Al-Omari A. A., Al-Dababneh K. A. Attitudes toward communication skills among students'-teachers' in Jordanian public universities. *Australian Journal of Teacher Education*. 2010; 35 (4): 1.
4. Iksan Z. H., Zakaria E., Meerah T. S., Osman K., Lian D. K., Mahmud S. N., Krish P. Communication skills among university students. *Procedia-Social and Behavioral Sciences*. 2012 Oct 17; 59: 71–76.
5. Behar-Horenstein L. S., Niu L. Teaching critical thinking skills in higher education: A review of the literature. *Journal of College Teaching & Learning (TLC)*. 2011 Feb 1; 8 (2).

6. Abrami P. C., Bernard R. M., Borokhovski E., Waddington D. I., Wade C. A., Persson T. Strategies for teaching students to think critically: A meta-analysis. *Review of Educational Research*. 2015 Jun;85 (2): 275–314.
7. Mahajan R. The key role of communication skills in the life of professionals. *IOSR Journal of Humanities and Social Science (IOSR-JHSS)*. 2015 Dec; 20 (12): 36–39.
8. Al-Shaibani Y. A., Daoud J. I. Thinking skills course and student's academic self-efficacy. *Australian Journal of Basic and Applied Sciences*. 2011; 5 (6): 403–415.
9. Ozkan H., Dalli M., Bingol E., Metin S. C., Yarali D. Examining the relationship between the communication skills and self-efficacy levels of physical education teacher candidates. *Procedia-Social and Behavioral Sciences*. 2014 Oct 7; 152: 440–445.
10. Bandura A. The explanatory and predictive scope of self-efficacy theory. *Journal of Social and Clinical Psychology*. 1986 Sep; 4 (3): 359–373.
11. Hoseinzadeh S., Sameri M. Study the relationship between self-efficacy, communication skills, critical thinking and creativity of high school students of district one of Urmia city. *International Journal of Humanities and Cultural Studies (IJHCS)*. 2016 Aug 13: 970–975.
12. Sünbül Z. A. The relationship between mindfulness and resilience among adolescents: Mediating role of self-compassion and difficulties in emotion regulation [Doctoral dissertation]. Ankara: Orta Doğu Teknik Üniversitesi; 2016.
13. Genuba R. L., Montejo G. S. 21st century skills of teachers and self-efficacy of college students. *International Journal of Recent Engineering Research and Development (IJRERD)*. 2018; 3 (5).
14. Ameen K. The need and impact of learning “Personality Development & Communication Skills” in LIS education: A case study. *Malaysian Journal of Library & Information Science*. 2017 Mar 22; 18 (1).
15. The Embassy of the Kingdom of Saudi Arabia [Internet]. Saudiembassy.net. 2019 [cited 2020 Feb 6]. Available from: <https://saudiembassy.net/>
16. Jamjoom Y. Private higher education and graduate employability in Saudi Arabia. In: A global perspective on private higher education. Chandos Publishing; 2016. p. 189-204.
17. Ibeaheem H. A., Elawady S., Ragmoun W. Saudi universities and higher education skills on Saudi Arabia. *International Journal of Higher Education Management*. 2018 Feb 1; 4 (2).
18. Al-Harbi S. S., Alshumaimeri Y. A. The flipped classroom impact in grammar class on EFL Saudi secondary school students' performances and attitudes. *English Language Teaching*. 2016; 9 (10): 60–80.
19. Sugito S., Susilowati S. M., Hartono H., Supartono S. Enhancing students' communication skills through problem posing and presentation. *International Journal of Evaluation and Research in Education*. 2017; 6 (1): 17–22.
20. Muste M., Baranya S., Tsubaki R., Kim D., Ho H., Tsai H., Law D. Acoustic mapping velocimetry. *Water Resources Research*. 2016 May; 52 (5): 4132–4150.
21. Meiers M. Teacher professional learning, teaching practice and student learning outcomes: Important issues. In: Handbook of teacher education. Springer, Dordrecht; 2007. p. 409–414.

22. Nold H. Using critical thinking teaching methods to increase student success: An action research project. *International Journal of Teaching and Learning in Higher Education*, 2017, 29.1: 17–32.

23. Leyer M., Hirzel A. K., Moormann J. Effectiveness of role plays on process-oriented behaviour in daily work practices: An analysis in the financial services sector. ECIS 2015 Completed Research Papers.

24. Zaghoul H. S. Using creative educational drama to enhance self-development skills for the students at university level. *International Journal of Advanced Computer Science and Applications*. 2018 Apr 1; 9 (4): 71–7.

25. Basheer A., Hugerat M., Kortam N., Hofstein A. The effectiveness of teachers' use of demonstrations for enhancing students' understanding of and attitudes to learning the oxidation-reduction concept. *Eurasia Journal of Mathematics, Science and Technology Education*. 2016 Dec 3; 13 (3): 555–70.

26. Hetland L., Winner E., Veenema S., Sheridan K. M. Making the case for the arts. In: *Studio thinking: The real benefits of visual arts education*. New York; 2013. 74 p.

27. Hammar Chiriac E., Forslund Frykedal K. Management of group work as a classroom activity. *World Journal of Education*. 2011; 1 (2): 3–16.

28. Brame C. J., Biel R. Test-enhanced learning: the potential for testing to promote greater learning in undergraduate science courses. *CBE—Life Sciences Education*. 2015 Mar 3; 14 (2): es4.

29. Pinquart M., Kauser R. Do the associations of parenting styles with behavior problems and academic achievement vary by culture? Results from a meta-analysis. *Cultural Diversity and Ethnic Minority Psychology*. 2018 Jan; 24 (1): 75.

30. Tuzlukova V., Al Busaidi S., Burns S. L. Critical thinking in the language classroom: Teacher beliefs and methods. *Pertanika Journal of Social Sciences & Humanities*. 2017 Jun 1; 25 (2).

31. Cottrell S. *Critical thinking skills: Effective analysis, argument and reflection*. Macmillan International Higher Education; 2017.

32. Han J. H., Ahn E., Hwang J. M. Effects of critical thinking and communication skills on the problem-solving ability of dental hygiene students. *Journal of Dental Hygiene Science*. 2019 Mar 31; 19 (1): 31–38.

33. Snyder L. G., Snyder M. J. Teaching critical thinking and problem-solving skills. *The Journal of Research in Business Education*. 2008 Apr 1; 50 (2): 90.

34. Choi Y. K., Bae S. M., Shin B. M., Son J. H., Park D. Y., Choi J. S. A case study on the validity of dental communication curriculum of a dental hygiene department. *Journal of Dental Hygiene Science*. 2017 Aug 31; 17 (4): 306–314.

35. Heidari M., Ebrahimi P. Examining the relationship between critical-thinking skills and decision-making ability of emergency medicine students. *Indian Journal of Critical Care Medicine*. 2016 Oct; 20 (10): 581.

36. Kadel P. B. Role of thinking in learning. *Journal of NELTA Surkhet*. 2014; 4: 57–63.

37. Rees H., Forrest C., Rees G. Assessing and managing communication needs in people with serious mental illness. *Nursing Standard*. 2018 Jul 5; 33 (4).

38. Bayley R. Thinking skills in the early years. *Gifted Education International*. 2002 Sep; 16 (3): 248–260.
39. Charil A., Laplante D. P., Vaillancourt C., King S. Prenatal stress and brain development. *Brain Research Reviews*. 2010 Oct 5; 65 (1): 56–79.
40. Forawi S. A. Standard-based science education and critical thinking. *Thinking Skills and Creativity*. 2016 Jun 1; 20: 52–62.
41. Nuswowati M., Taufiq M. Developing creative thinking skills and creative attitude through problem based green vision chemistry environment learning. *Jurnal Pendidikan IPA Indonesia*. 2015 Nov 2; 4 (2).
42. Hoseinzadeh S., Sameri M. Study the relationship between self-efficacy, communication skills, critical thinking and creativity of high school students of district one of Urmia city. *International Journal of Humanities and Cultural Studies (IJHCS)*. 2016 Aug 13: 970–5.
43. Majid S., Liming Z., Tong S., Raihana S. Importance of soft skills for education and career success. *International Journal for Cross-Disciplinary Subjects in Education*. 2012; 2 (2): 1037–42.
44. Alvi M. A manual for selecting sampling techniques in research. Karachi: MPRA Paper No. 70218; 2016.

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HYPOTHESIS CODES

Table 1. Codes of hypothesis 1

| Codes | Variable name |
|--------------|---|
| A1 | Leads to better relationships with other people |
| A2 | Enriches creativity among the students |
| A3 | Enriches imagination among the students |
| A4 | Improves student's willingness to act |
| A5 | Helps to reinforce academic, emotional, and interpersonal objective |
| A6 | Helps to understand others better |
| A7 | Improves student behaviour |
| A8 | Brings a positive attitude among the students |
| A9 | Improves student's mindset |

Table 2. Codes of hypothesis 2

| Codes | Variable name |
|--------------|---|
| B1 | Helps to provide a logical structure |
| B2 | Helps to understand the meaning of the expression |
| B3 | Helps to determine what to do |
| B4 | Helps to make better judgments |
| B5 | Helps to determine what to view |

Table 3. Codes of hypothesis 3

| Codes | Variable name |
|--------------|--|
| C1 | Helps to analyse things better |
| C2 | Helps to understand the meaning of the expression better |
| C3 | Helps to analyse the situation better |
| C4 | Helps to determine the pros and cons |
| C5 | Helps to consider the impact on other people better |
| C6 | Specifies clear and reachable goals in the group |
| C7 | Brings greater efficiency |
| C8 | Helps to find better solutions |
| C9 | Encourages a positive work relationship |
| C10 | Creates a culture of celebration |
| C11 | Reduces conflicts |

Table 4. Codes of hypothesis 4

| Codes | Variable name |
|--------------|---|
| D1 | Induces the cognitive-behavioural interplay |
| D2 | Improves memory |
| D3 | Improves analytical capabilities |
| D4 | Improves concentration |
| D5 | Increases intelligence |
| D6 | Helps to organise thoughts |
| D7 | Helps to organise ideas |
| D8 | Helps to organise the mind |
| D9 | Makes the sense of environment |
| D10 | Helps to organise learning process better |
| D11 | Brings smoothness in the working process |
| D12 | Brings flexibility |
| D13 | Brings originality in the ideas |
| D14 | Helps to explore things better |
| D15 | Improves student potential |

Table 5. Codes of hypothesis 5

| Codes | Variable name |
|--------------|---------------------------------|
| G1 | Leads to a successful career |
| G2 | Better social interactions |
| G3 | Makes up an overall personality |
| G4 | Induces a positive attitude |
| G5 | Helps to get a better job |

Appendix 2

Self-development skills questionnaire for university students Section A (Demographics)

1. Gender
 - Male
 - Female
2. Age
 - 18–20 years
 - 20–22 years
 - 22–24 years
3. Education background
 - Arts
 - Commerce
 - Science
 - Humanities
 - Islamic studies

- Arabic studies
- Social studies
- Mathematics'
- English
- Technical and vocational education
- Other
- 4. Colleges and academic disciplines
 - Faculty of Education and Arts
 - College of Business Administration
 - College of Science
 - Community College
 - College of Engineering
 - Faculty of Computing and Information Technology
 - Faculty of Applied Medical Sciences
 - Faculty of Medicine
 - Other
- 5. Family monthly income
 - Less than 10,000 Saudi Arabian Riyals (SAR)
 - 10,000 SAR – 20,000 SAR
 - 30,000 SAR – 40,000 SAR
 - More than 40,000 SAR

Section B (General background)

6. Does your university undertake programmes that focus on improving communication and thinking skills among the students?
- Yes
 - No
7. If yes, are you involved in such courses or programmes?
- Yes
 - No
8. What are the strategies or the methods that have been adopted by your university to improve the communication skills among the students?
- Discussion method
 - Role-play method
 - Demonstration method
 - Group work
 - Using apps
 - Other strategies
9. Does your university use the six-hat strategy to improve the communication skills among the students?
- Yes
 - No
10. What are the possible benefits of improving communication and thinking skills directed on self-management skills development?
- Lead to self-development
 - Improve problem-solving ability

- Improve decision-making ability
- Improve mental abilities
- Lead to intellectual development
- Lead to creative thinking
- Have a positive impact on practical life
- Other strategies

11. What are the possible challenges that emerge due to the new teaching methods adopted instead of traditional ones?

- Lead to waste of time
- Create chaos in the classroom
- The teacher cannot give equal attention to all the students
- Unequal participation from the student side
- Teachers lose the track of the course completed
- Other challenges

Section C (Inferential analysis)

12. Do communication and thinking skills have an impact on student's self-development?

- Strongly disagree (SD)
- Disagree (D)
- Neutral (N)
- Agree (A)
- Strongly agree (SA)

| Self-development skills ... | SD | D | N | A | SA |
|---|-----------|----------|----------|----------|-----------|
| lead to better relationships with other people | | | | | |
| enrich creativity among the students | | | | | |
| enrich imagination among the students | | | | | |
| improve student's willingness to act | | | | | |
| help to reinforce academic, emotional, and interpersonal objectives | | | | | |
| help to understand others better | | | | | |
| improve student behaviour | | | | | |
| bring a positive attitude among the students | | | | | |
| improve student's mindset | | | | | |

13. Do communication and thinking skills have an impact on the problem solving of the student?

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

| Self-development skills ... | SD | D | N | A | SA |
|--|-----------|----------|----------|----------|-----------|
| help to provide a logical structure | | | | | |
| help to understand the meaning of the expression | | | | | |
| help to determine what to do | | | | | |
| help to make better judgments | | | | | |
| help to determine what to view | | | | | |

14. Do communication and thinking skills have an impact on dealing with different people and develop the ability to teamwork among the student?

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

| Self-development skills ... | SD | D | N | A | SA |
|---|-----------|----------|----------|----------|-----------|
| help to analyse things better | | | | | |
| help to understand the meaning of the expression better | | | | | |
| help to analyse the situation better | | | | | |
| determine the pros and cons | | | | | |
| consider the impact on other people better | | | | | |
| specify clear and reachable goals in the group | | | | | |
| bring greater efficiency | | | | | |
| find better solutions | | | | | |
| encourage a positive work relationship | | | | | |
| create a culture of celebration | | | | | |
| reduce conflicts | | | | | |

15. Do communication and thinking skills have an impact on the mental ability, intellectual development, and creative thinking of the student?

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

| Mental ability ... | SD | D | N | A | SA |
|---|-----------|----------|----------|----------|-----------|
| induces cognitive-behavioural interplay | | | | | |
| improves memory | | | | | |
| improves analytical capabilities | | | | | |
| improves concentration | | | | | |
| increases intelligence | | | | | |
| Intellectual development ... | | | | | |
| helps to organise thoughts | | | | | |

| | | | | | |
|---|--|--|--|--|--|
| helps to organise ideas | | | | | |
| helps to organise the mind | | | | | |
| makes sense of the environment | | | | | |
| helps to organise learning process better | | | | | |
| Creative thinking ... | | | | | |
| brings smoothness in the working process | | | | | |
| brings flexibility | | | | | |
| brings originality in the ideas | | | | | |
| helps them to explore things better | | | | | |
| improves student potential | | | | | |

16. Do communication and thinking skills have an impact on the practical life of the student?

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

| Self-development skills ... | SD | D | N | A | SA |
|-------------------------------------|-----------|----------|----------|----------|-----------|
| lead to a successful career | | | | | |
| help to improve social interactions | | | | | |
| make up an overall personality | | | | | |
| induce a positive attitude | | | | | |
| help to get a better job | | | | | |