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Can Digital Transformation Solve the Problem of Arctic Youth Migration Outflow?

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Abstract: Youth educational migration is an urgent problem for most Arctic cities. In particular, this problem is extremely important for Russia in the context of changing the paradigm of the planned development of the Arctic oil and gas economy into indefinite long-term prospects and scenarios of Arctic development. This situation led to reducing social-economic northern benefits and compensations and strengthens the trends of Arctic youth educational migration. However, the experience of digital transformation and forced distance learning due to the pandemic of 2020 could bring young people a new understanding of the opportunities of digitalization, influencing their migration decisions. To clarify the potential of digital technologies in solving the problem of youth migration outflow in the Russian Arctic, we surveyed the students at technical schools and colleges of the Yamal-Nenets autonomous area, Russia; sample size 1532 students in total. The analysis of the survey's results proved the intention of most respondents to move to larger cities in non-Arctic territories. Together with that, we revealed a high potential of digital technologies in addressing the problem of youth migration which was previously considered unsolvable. In particular, the accessibility of quality distance education can sufficiently increase the attractiveness of Arctic territories for youth life, study, and development. Basing on the research results, we suppose that Arctic youth migration outflow can be sufficiently decreased if the measures proposed in the research are implemented with the help of digitalization.

Keywords: youth migration; educational migration; Arctic migration; digitalization; distance education

1. Introduction

Digital technologies constantly expand opportunities to solve social problems that previously had no solution with the traditional methods and approaches. One of such problem is the Arctic youth migration outflow, mostly educational migration: in 2018, the difference in migration of young people in the age range of 15–19 was 297 in the Republic of Karelia, 1360 in the Komi Republic, 1399 in the Arkhangelsk region, 1268 in the Murmansk region, 1164 in the Yamal-Nenets autonomous area, 1157 in the Republic of Sakha (Yakutia), and 165 in the Chukotka Autonomous District [1]. Since the vast majority of those young people who have left do not return to their native villages or small towns, this situation stipulated numerous human resource problems in the “donor territories”, which,

in turn, further stimulates the youth migration outflow [2]. Thus, in 2004, 14% of the polled eleventh graders living in small towns intended to stay in their hometowns after graduation from school, and in 2015 it was only 4% [3]. A low percentage of return migration does not save the situation in the “donor territories” [2,4–6], including Arctic regions [1]. Non-return youth migration to the big cities is a steady world trend in the context of rapid urbanization, which appears stronger in the northern territories because of their unfavorable conditions for living. The urgency of this problem became extremely high for the Russian Arctic due to its increased world and national strategic meaning and the importance of its sustainable development [7,8]. At the same time, decreasing youth migration outflow is extremely difficult, considering the specificity of general socioeconomic, environmental, and demographic challenges in the Arctic territories, including harsh climate, remoteness, low density of populations [9], and overall negative net migration rate [10]. The previous research on Arctic intellectual capital showed that a decline in social–economic development of the Arctic regions is sufficiently stipulated by the decline in the level of human capital needed for the next technological transformations [11].

This study aims to identify the potential for digitalization to attract youths to live, study, and develop in their home Arctic cities. In practical terms, the research is aimed at investigating the perspectives of digitalization in solving the problem of youth migration outflow. A better understanding of these perspectives allows for building a more effective and relevant policy of human development in the Arctic region of Russia in compliance with the purposes of Arctic sustainable development and considering digitalization trends. The study is focused on the Russian Arctic, but the problem and discussion of the results are also important for other countries for which the problem of youth migration outflow is urgent.

2. Materials and Methods

2.1. Theoretic Foundation

Numerous studies show that the main reason for youth migration is to go to study in large cities [5,6,12–15]. Educational migration explains about 80% of youth migration cases [6]. All other reasons share the remaining 20%: poor job prospects, low salaries, lack of ample opportunities to spend leisure time, high costs of going on vacation, unfavorable climatic conditions, etc. Consequently, digitalization can reduce the migration outflow of young people from the Arctic territories only if it can eliminate or sufficiently decrease the level of youth educational migration. This problem can be solved by offering acceptable alternative (digital) forms of quality education, as well as ensuring the satisfaction of other significant youth needs and the motives that go together with a desire to get an education: professional and personal growth, making new friends, socialization, self-realization, etc. Psychologists of the 20th century formulated the main reasons determining the behavior of people (G. Allport, H. Murrey, G. Kelly, H. Heckhausen, R. Cattell, A. Maslow, E. Erikson, I. S. Petrovsky, A. G. Asmolov, Yu. M. Orlov, D. A. Leontyev, and many others). Since then, these reasons have not undergone fundamental changes. Summarizing the reasons for the behavior of young people, the most significant ones should be highlighted: the need for belonging, communication, and love (associated with the need for recognition by a significant environment, for self-respect, for a sexual/marriage partner), the motive for gaining independence (personal and professional self-determination, freedom of action, self-realization), the motive for improving the quality of one’s life, gaining broad life prospects (a decent standard of living, opportunities for professional and personal growth, self-actualization), and the motive for receiving joy (access to entertainment, exciting activities, spending interesting leisure time). With all the significant differences in content, dynamics, and in the hierarchy of needs between individuals, the listed reasons for behavior are characteristic of all young people and determine the direction of people’s behavior at a young age [16–25].

Despite the global experience of forced distance learning gained in almost all specialties during the 2020 pandemic, the readiness of young people to accept a distance learning form (of comparable quality

to full-time education) as an alternative to educational migration is not clear yet. For example, high-quality video lectures (especially in the format of educational interactive films) with the participation of the best professionals in the industry are preferable (both in content and format) than listening to an ordinary teacher in the classroom. The most noticeable advantages (for the student) in this case are (a) high-quality content—both in terms of content and audiovisual presentation, moreover, edited content—cleared of unnecessary random information; (b) the ability to choose the time for the perception of information; (c) the ability to pause or rewind; (d) saving time spent on getting to the classroom and back. At the same time, there are still a lot of challenges in providing high-quality distance learning, which often requires not only high-quality content and interactive technologies, but also entire virtual laboratories are needed (in the space of which the student can master the necessary equipment), access to special (often expensive) software, online consultations with teachers, real professional and soft skills practice, and much more, depending on what individual and professional competences are being developed.

At the same time, the role of digitalization in decreasing young people's migration outflow is not limited by the sphere of distance learning. In the general sense, digitalization should be aimed at improving the quality of life of young people, considering all their motives of behavior, to make Arctic territories more attractive for living, studying, and developing. Together with that, the methods of the application of digital technologies are still not obvious. For example, it is not entirely clear how through digitalization it is possible to increase employment opportunities for young people or to reduce the impact of corruption (based on family and other personal ties) in the employment policy of Arctic companies in small towns. Nevertheless, new opportunities have opened up with digitalization trends. This situation requires studying the perspectives, potential impact, and ways for the possible application of digital technologies for decreasing educational migration outflow. This study will allow for identifying aspects of the quality of life that are significant for young people and which can be improved through developing digital technologies.

2.2. Method Description

2.2.1. Research Methods

In this research, we are basing the study on those ideas of young people that they already take into account in their choice to stay or leave for education in a larger city. This necessity determines the choice of the subject and method of this research. The subject of the research is the ideas of college and technical school students about what might motivate them to stay to study and live in their home Arctic cities. Since the available theoretical foundations allow us to identify the main reasons for youth migration, we used a standardized survey as a method of gathering data. Survey questions were designed in compliance with the main reasons for Arctic youth educational migration.

To formulate the survey questions, we considered both the general main reasons for youth behavior described in theoretical psychological literature and specific reasons for Arctic youth migration most often indicated in the current northern media sources [26–35]. That is, “severe climate” was not considered in the statements of the survey despite it being one of the most popular reasons for moving from the north to other regions, because it is a natural factor and cannot be changed with the support of digital technologies. However, other sufficiently changeable factors, safety, opportunities for jobs, business, development, education, and self-realization, were considered in the survey. The reasons for youth migration outflow were formulated as statements, which the respondent was asked to estimate by the degree of agreement or disagreement, considering measures supposed to be implemented using digitalization. The design of a standardized survey assumes that the respondent chooses one answer from four proposed options, indicating the degree of agreement with the proposed statement (yes; rather yes than no; rather no than yes; no). Thus, we use an ordinal scale that is adequate for assessing the degree of conviction or motivation.

We used the standard descriptive statistics method and matrix factor modeling to process the results of the survey.

2.2.2. Explanatory Hypothesis

We formulate an explanatory hypothesis as a conceptual premise explaining the formed list of questions and the research focus for interpreting the research results.

Based on the existing theoretical base about motives for people's behavior, including the specifics of youth behavior, and on the existing empirical research about youth migration, we suppose that young people will stay to live in their home Arctic cities if they feel that they are safe and can develop dynamically there (get a profession in demand, a decent salary, personal and professional growth), enjoy life (have wide opportunities for spending leisure time, equal access to the benefits of civilization), can influence social life (participate in the self-government of the territory, continuously improving the quality of life of all people in the Arctic territories of Russia), and if they see opportunities for self-realization and creativity no less than on the "mainland".

2.2.3. Characteristics of the Sample

According to the Resolution of the Armed Forces of the Russian Federation of 03.06.1993 N 5090-1 "On the main directions of youth policy in the Russian Federation", the category of youth in Russia includes citizens from 14–30 years old (except for certain cases). Nevertheless, for this research purpose, a narrower sample within these age boundaries is more relevant. Students at schools, technical schools, and colleges are the main potential educational migrants to the universities of other regions [5]. Since the main reason for the movement of young people from the Arctic territories of the Russian Federation is educational migration, it would be adequate to limit the sample of the respondents to this category of students. Thus, we asked students at technical schools and colleges in different Arctic cities of Muravlenko, Nadym, Novy Urengoy, Noyabrsk, Salekhard (YANA O) to answer the survey. The survey was carried out with the support of the management of the educational institutions in the classrooms in the online form.

The sample is non-random and targeted [36]. The sample is 1532 respondents, including 677 men and 855 women aged 15–23 years, students of Arctic (YANA O) technical schools and colleges. The representativeness of the sample is ensured by the correspondence between the data source (youth completing their studies in college or technical school) and the research question (the ideas of student youth about what digitalization can induce them to stay to study and live in Arctic cities).

The representativeness of the sample is ensured by: (a) the main condition for representativeness at the methodological level of research planning—the correspondence between the data source (youth completing their studies in college or technical school) and the research question (ideas of student youth about what digitalization can induce them to stay in school and, possibly, then live in a northern city) [37]; (b) a significant number of respondents (more than 1500), at which the distribution of answers stabilizes, making it impractical to increase the number of respondents [38]; (c) the trend of the Arctic youth migration outflow has been stable for all Russian Arctic regions for many years; (d) the selected cities are not unique and are similar to other Arctic cities in Russia. Thus, the results of the study can be extrapolated to other Arctic cities of Russia; (e) the correspondence of the socio-demographic parameters of the sample and the general population, which are basic for assessing the subject of this study [38]: social status—students who have to choose a place for further education, the representation of students' answers from different northern cities, as well as agreement between the gender ratio in the sample of students and in the general population.

2.2.4. Research Instruments

The youth survey was named "What digitalization can help me stay to study/live in the northern city". We introduced the survey with the words "To improve the lives of people in the northern territories of Russia, your opinion is needed! Therefore, we ask you to take part in a scientific study,

the purpose of which is to obtain information on how modern digital technologies can help young people stay to study and live in the Arctic city". The introduction began with: "First, mark if you are going to move to study in a larger city after graduation?"

- Yes, I will go to study in another city.
- No, I will not move to study in another city.
- Don't know yet if I will move to another city.

Then, this was followed with the instruction for the main questions: "Please consider carefully how each of the measures below can influence your decision to stay to study and, possibly, then live in your home Arctic city ("YES" means that if the measure was implemented, then this would be sufficient so that you stay to study/live in the Arctic, and "NO" means that the changes will not affect your decision)". Further, the respondent was asked questions in the form of formulations of measures that can presumably be implemented using digitalization. At the same time, for each question, the respondent was allowed to choose only one of four answer options: (1) YES; (2) Rather YES than NO; (3) More likely NO than YES; (4) NO. The last, open-ended question was aimed at obtaining additional information.

The list of the questions (proposed measures) was the following:

Would you stay in your home Arctic city if digital technologies will help to:

- (1) Ensure that you receive no less high-quality (than on the "mainland") higher (or secondary) vocational education in the home city (completely or mainly in a distance format) in the desired specialty.
- (2) Provide no fewer (than on the "mainland") budgetary places to receive education locally (completely or mainly in a distance format) in the specialty I need.
- (3) Eliminate corruption in employment so that the most qualified specialist can get any vacant job, and not the one with "connections", "cronyism", etc.
- (4) Provide opportunities to work remotely with any employer, wherever they are, in those professions where remote work is possible (designers, programmers, teachers, translators, etc.).
- (5) Provide in the Arctic territories of the Russian Federation more favorable conditions than in the "mainland" for the starting and development of small and medium-sized businesses.
- (6) Provide in the Arctic territories of the Russian Federation favorable conditions for science and innovations (including in the areas of construction, medicine, education, production, energy, employment, the use of instruments for the exchange of labor results).
- (7) Provide conditions for real participation in the self-government of the territory (electronic voting, regional public services, etc.), so that everyone (considering the confirmed level of competence) has a real opportunity to influence the strategy of the territorial development.
- (8) Ensure the complete physical safety of people in the Arctic cities.
- (9) Provide significantly greater opportunities for self-realization, creativity, and leisure.
- (10) I would stay to study (and, possibly, then live) in the Arctic city if, with the help of digital technology, it would be possible to ...

The answers to the last open-ended question were processed by the method of content analysis—first by counting the frequencies of semantically similar answers and then grouping them. At the end of the survey, the respondent had to select his/her locality from the list of Arctic cities or add his/her own, and indicate gender and age.

2.2.5. Data Collection

Data collection was carried out from 23 September to 5 October 2020, using the Internet service Google Forms.

Before the statistical processing of the data, 93 records containing empty answers (at least one unanswered question) or deliberately incorrect data were deleted (the specified age does not

correspond to the surveyed group; obscene vocabulary, euphemisms, etc.) were deleted. As a result, 1532 respondents who filled out the forms following the instructions and sampling requirements were left. The sample is characterized by the following distribution of respondents by the place of residence (Table 1):

Table 1. Distribution of the respondents by place of residence.

City	Respondents, In Total	Village	Respondents, In Total
Gubkinsky	3	Aksarka	2
Labytnangi	48	Antipayuta	3
Muravlenko	297	Gyda	1
Nadym	352	New port	1
New Urengoy	283	Nyda	1
Noyabrsk	168	Pangody	1
Omsk	2	Seyakha	1
Salekhard	358	Tazovsky	2
Tarko-Sale	4	Urengoy	2
		Hanimei	2
		Shuryshkary	1
In total	1515	In total	17

Statistical data processing was performed in the StatPlus software, Version 7 (AnalystSoft Inc., Walnut, CA, USA; license holder: Vadim Levkin), and MS Excel program (MS Office 365, the corporate license of Tyumen State University; Microsoft Corp., Redmond, WA, USA).

3. Results

3.1. Assessment of the State of the Problem of Educational Migration

A general descriptive statistics analysis confirms the relevance of the problem of educational migration among those who are receiving secondary vocational education in the Arctic educational institutes: more than a third of the surveyed students of technical schools and colleges express their intention to leave to continue study in a larger city, and another third of the respondents do not have clear decision yet (Table 2). Thus, according to the survey sample, more than 70% of the students getting secondary vocational education are potential educational migrants, considering confidence intervals of $\pm 2.43\%$ and $\pm 2.41\%$, calculated with a 95% confidence level (Table 2).

Table 2. Distribution of answers to the question “Are you going to move to study in a larger city?” by gender.

	Entire Sample Frequency	% (CI)	Men %	Women %
No	400	26% ($\pm 2.20\%$)	25	27
Don't know	579	38% ($\pm 2.43\%$)	40	36
Yes	553	36% ($\pm 2.41\%$)	35	37
In total	1532	100%	100	100

We did not find statistically significant differences in responses between men and women that allowed us to consider the gender factor insufficient in the choice of educational migration. For a significance level (α) of 0.05 and two degrees of freedom (df), the critical value χ^2 is 5991. As can be seen from Table 3, for all the answer options, the χ^2 values found are below the critical one.

Table 3. Significance of gender differences in answers between respondents.

Answers	χ^2	<i>p</i> -Value	$\alpha = 0.05$
No	0.077	0.962	Not significant
Don't know	0.211	0.900	Not significant
Yes	0.056	0.973	Not significant

For all answer options, the χ^2 values are below the critical value, which is 5991 for a significance level (α) of 0.05 and two degrees of freedom (df), and when the *p*-value is larger than 0.05, there is no significant difference in educational migration intentions of the respondents in different Arctic cities (Table 3).

To check possible differences by cities of residence, five cities with the largest number of respondents were selected as groups for comparison: Muravlenko, Nadym, Novy Urengoy, Salekhard, Noyabrsk. Comparison results for these cities confirm that the problem of educational migration is common for Arctic cities (Table 4).

Table 4. Distribution of answers to the question “Are you going to move to study in a larger city?” by cities.

	Muravlenko		Nadym		Novy Urengoy		Salekhard		Noyabrsk	
No	50	17%	105	30%	106	37%	80	22%	47	28%
Don't know	124	42%	164	47%	97	34%	101	28%	67	40%
Yes	123	41%	83	24%	80	28%	177	49%	54	32%
In total	297	100%	352	100%	283	100%	358	100%	168	100%

The analysis of the significance of differences by the Pearson chi-square method showed that there are no statistically significant differences in the distribution of answers among the respondents from different cities, which confirms the generality of the problem of educational migration outflow for Arctic cities. For all answer options, the χ^2 values are below the critical value, which is 15,507 for a significance level (α) of 0.05, with eight degrees of freedom (df) 8, and when the *p*-value larger than 0.05, there is no significant difference in educational migration intentions of the respondents in different Arctic cities. (Table 5).

Table 5. Significance of differences in answers between respondents from different cities.

Answers	χ^2	<i>p</i> -Value	$\alpha = 0.05$
No	8761	0.363	Not significant
Don't know	5675	0.684	Not significant
Yes	11,805	0.160	Not significant

3.2. Assessment of the Potential Impact of Digitalization in the Form of Proposed Measures

Research results showed a high level of the potential impact of the proposed measures achievable by new means of digitalization. The measures assessed by respondents were listed, first of all, in descending order of the number of “yes” answers, and secondly in descending order of the number of “rather yes” answers.

The general distribution of answers is illustrated by the median at the end of Table 6. The results of the content analysis of answers to an optional open-ended question largely repeat the statements in the closed-ended questions (Table 7). More than half of the respondents express their clear readiness to stay and about a third of respondents are inclined to stay in their home cities if the proposed measures are implemented. If at least one proposed measure is implemented, positive changes in intentions to stay can be expected among 79–92% of students.

Table 6. Ranked list of proposed measures.

№	Proposed Measures	Percentage of Answers (CI with Confidence Level 95%)			
		Yes	Rather Yes	Rather No	No
1	Significant expansion of opportunities for self-realization, creativity, and leisure	67 (±2.36)	25 (±2.18)	5 (±1.04)	3 (±0.92)
2	High physical safety of people in the city	67 (±2.35)	23 (±2.08)	6 (±1.19)	4 (±1.02)
3	More favorable conditions than on the “mainland” for the starting and development of small and medium-sized businesses	58 (±2.47)	31 (±2.32)	6 (±1.23)	5 (±1.05)
4	Favorable environment for science and innovations	58 (±2.47)	29 (±2.27)	8 (±1.36)	5 (±1.12)
5	Fair job competition	58 (±2.46)	28 (±2.21)	9 (±1.44)	5 (±1.11)
6	Wide opportunities for real participation in the self-government of the territory	51 (±2.50)	34 (±2.37)	10 (±1.49)	5 (±1.13)
7	The ability to work remotely with any employer, wherever they are (where remote work is possible)	50 (±2.50)	31 (±2.32)	13 (±1.62)	6 (±1.21)
8	No fewer (than on the “mainland”) budget-funded places to receive education in the home city	48 (±2.50)	33 (±2.37)	12 (±1.59)	7 (±1.29)
9	Opportunity to get high-quality professional education (fully or mainly in a distance format)	39 (±2.44)	40 (±2.45)	13 (±1.70)	8 (±1.34)
	Median	58	31	9	5

Note: the wording of the questions has been reduced to the meaning of the proposed measure.

Table 7. Ranked answers to an open-ended question.

№	What is Important to Stay to Study and Live in an Arctic City? (Your Answer)	Frequency of Mentions
1	Employment opportunities (including no work experience), make good money	108
2	Getting the desired profession, higher education	101
3	Developed city, infrastructure, Internet, increased level and quality of life	43
4	Would have left anyway	34
5	More places to spend your leisure time	24
6	Opportunities for development, sports, self-realization	17
7	Warmer climate	14
8	Affordable housing	11
9	Availability of full-time higher education	10
10	Opportunities for self-realization in the desired specialty	9
11	Fast and affordable transport, including to other cities	7
12	Improved medicine	6

4. Discussion

4.1. Results Discussion

According to the data analysis, more than 70% of the students getting secondary vocational education are potential educational migrants, considering that 38% (±2.41%) of the respondents were sure and 36% (±2.43%) have not yet decided on moving to study in a larger city (Table 2). At the same time, only 34 (2%) students noted that they would have left anyway, that is even if all suggested measures would have been realized (Table 7). It means that the remaining 98% of students feel ready to stay study and live in home Arctic cities if the complete complex of suggested measures will be implemented with the help of digital technologies. This research result proves our explanatory hypothesis: young people are ready to stay to live in their home Arctic cities if they feel that they are safe and can develop dynamically there, enjoy life, can influence the social life, and if they see opportunities for self-realization and creativity no less than on the “mainland”, which can solve the problem of Arctic youth migration outflow.

The research results revealed that the need for safety is one of the strongest motives in the decisions of young people to move to another city, which corresponds to Maslow's hierarchy of motives [21]. Thus, a sufficient increase in the physical safety of people in the Arctic cities can positively influence the decision of 90% of respondents, as 67% (± 2.35) answered "yes" and 23% (± 2.08) answered "rather yes" when assessing the positive influence of increasing safety by the means of digital technologies on their decision to stay in the Arctic home city (Table 6). Considering that the criminal situation in Arctic cities often is much better than in other cities in Russia, this issue needs further investigation and deeper understanding. Together with that, young people attach the highest subjective significance to opportunities for self-realization: changes in this factor can influence 92% of students in their choice to stay or go to study in another city. In general, the ranked list of proposed measures corresponds both to the common hierarchy of people's needs and the specifics of the motives of youth behavior described in different psychological theories [16–25].

At the same time, we revealed an unexpected result: opportunities for obtaining high-quality distance education (see items 8 and 9, Table 6) and the opportunity to work remotely (item 7, Table 6) ended up at the very bottom of the ranked list of the priorities in the youth choice to move to another city or to stay at the home city. Anyway, a sufficient number of the respondents (79%) answered "yes" or "rather yes" to the question about the possibility to stay in the home city in the situation of increasing opportunities to get high-quality professional education (fully or mainly in a distance format). Besides, in the open-ended question, the opportunity to get an education and employment opportunities were mentioned more often than other important factors for the respondents. Nevertheless, some respondents specifically emphasized that they want to receive full-time higher education. Taking this into account, we suppose that the ideas of young people living in the Russian Arctic about good jobs and salaries are closely connected with getting high-quality education traditionally, i.e., there is not enough trust in the quality and benefits of distance learning. Nevertheless, subjective perceptions and attitudes can be changed with new experiences and facts. Digitalization trends imply fast-developing hardware and software which can provide high-quality professional training remotely. Together with that, the experience of forced distance learning in 2020 showed that high-quality teaching is possible remotely in many areas of training. Thus, distance learning still has a very high potential for decreasing youth migration outflow.

This result may indicate that young people consider the place of study more as a place for present and future life, including the possibility of creating and developing their own business and relationships (for example, creating their own family) possibly even while getting an education. Considering the results of existing research proving that educational migration explains about 80% of youth migration cases [6], we can suppose that moving to study (education itself) can be an external explanatory reason while deep motives lie in the sphere of safety, opportunities for socialization, personal and professional self-realization, and life quality. At the same time, the territories with high youth migration outflow suffer from a disadvantage in social capital needed for creating wider opportunities for developing the territories and increasing life quality. To break this cycle of the youth migration problem, new nontraditional approaches are necessary. Digital technologies sufficiently expanded opportunities for distance learning, personal and professional development, and solving social problems, which is an important factor in decreasing educational migration. Based on the research results, we suppose that Arctic youth migration outflow can be sufficiently decreased if the measures proposed in the research are implemented with the help of digitalization. The results of the study show that the possibilities for reducing educational migration can be significantly expanded through the implementation of measures that are not directly related to education but improve the overall youth quality of life.

We agree with Mkrtchyan and Florinskaya that youth migration outflow stipulated numerous human resource problems in the "donor territories" [2], which decrease communities' resilience to the social changes and lead to economic devastation. Due to the specificity of age motivation and craving new things, youths are the main "catalyst" for updating the socio-cultural environment and for the development of innovation and entrepreneurship in the territories. Thus, it is crucially important to

attract youths to the territories which are strategically important and need to increase their potential for sustainable development.

4.2. Research Limitations and Direction of Further Research Development

The research is focused on the most mobile age group (15–24 years): students at technical schools and colleges in different Arctic cities. Thus, the upper limit of the age range excludes those who decided to study at an older age (25–30 years). Nevertheless, young people between the ages of 24 and 30 migrate sufficiently less frequently than graduates of secondary schools, technical schools, and colleges [1]. However, understanding the motivation for moving of this age group can shed more light on how the motivation of younger students (the most mobile group) can be rethought if they communicate with older fellow countrymen and receive advice from them on the choice to move or stay. We can suppose that the decision to move among young people in the age range of 24–30 years is mostly not related to education and has a more complex structure of motives, given the possible presence of a family and professional experience. Therefore, the motivation of young people from 24 to 30 years old requires separate research. Nevertheless, the suggested measures can also be evaluated by this age group and compared with the results of this research.

The research sample is limited to urban students, which is stipulated by the Arctic-specific concentration of educational institutes in the big Arctic cities. Considering that, the research sample is representative in relation to the subject of research even without a survey of rural youths. At the same time, the limitation of the study is that we interviewed students of only five Arctic cities (Muravlenko, Nadym, Novy Urengoy, Noyabrsk, Salekhard) in one Arctic region (YANAO). Subsequent research can extend the sample, including more Arctic cities in different Arctic regions.

The third limitation of the study is the list of suggested measures, which can be extended and added to in additional qualitative studies. Additionally, the research results do not clarify how to implement the suggested measures using certain digital technologies, which can be a subject of subsequent research and practice.

Existing studies devoted to the problems of youth migration are not numerous and sufficiently differ in their purposes and research focus and there are very limited opportunities for comparative studies in this field. Additionally, it should be noted that the problem of youth migration often arises significantly more in cases of disadvantaged regions or countries. These disadvantages have a very different nature, for example, unstable political situations, severe climate, poverty, unemployment, etc. Each region has its specific challenges and attractors influencing youth migration behavior, making it difficult to find general reasons for youth educational migration outflow and common decisions to solve this problem. Together with that, researchers note increased youth outflow in rural areas [15], small towns [3,6], and northern areas [31]. This study is focused on the Arctic area, which has pronounced climate and social–economic specifics, thus, some measures in the questionnaire were formulated considering specific problems of the Russian Arctic, which may be not relevant for other territories. Anyway, the research methodology comprising general behavior motives, specific youth behavior motives, and specific regional factors can be modified and used with the same purposes for analyzing the cases of other regions. Meanwhile, the opportunities of digital technologies are universal, and their usefulness depends on their purposeful application to the existing problems. Digital technologies can solve problems in a new way, integrating people in a virtual world with opportunities to study, develop, and communicate at a completely different level. Thus, the potential of digital technologies for solving the problem of youth migration outflow should be studied in different conditions.

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