RETHINKING MARITIME EDUCATION AND TRAINING FOR GENERATION Z STUDENTS

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ABSTRACT
Every country's economy depends on workforce competencies that are developed mostly by education systems, in which institutions of higher education play an important role. With the spread of higher education and the continuous development of opportunities for lifelong learning, higher education institutions are facing challenges organising education by addressing the needs and preferences of different generations. As research shows, different generations have various learning preferences, needs and goals in life, and education. To organise teaching and learning activities effectively (now and in the future), educational institutions need to understand the characteristics of the multi-generational student population, and the tendencies in future changes to the student population. This is important for many industries, including the maritime industry. To supply young talent to the maritime industry, maritime education and training also need to take into account the future workforce and the needs of industry, in terms of new challenges, such as technological changes, sustainability goals, decarbonisation, and the blue economy. This paper presents an analysis of the changes in the student population at the World Maritime University higher education institution over the last five years, with a special focus on Generation Z. Insights into the organisation of effective education to address the needs of the maritime industry are presented based on the tendencies identified.
KEY WORDS: *maritime education and training (MET), Generation Z, education for sustainable development (ESD).*

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Introduction

The workforce competences of a country determine its economic performance, such as gross domestic product (GDP). A competent and educated workforce leads to increased productivity, innovation, and the competitiveness of the country, which can have a positive impact on economic growth and development (Keeley, 2007; Descy, 2005). Education systems play a vital role in this process; research proves that investment in education systems develops meaningful and measurable benefits, to both individuals (micro-level), and societies (macro-level) (e.g. Keeley, 2007; Descy, 2005; Little, 2020; Rado, 2020). Well-educated and responsible people (on a micro-level) are successful in life, efficient at work, and socially responsible as citizens. On a macro-level, as part of an effective and socially responsible workforce, educated and skilled people help to contribute not only to economic growth and the development of innovation, but also bring non-material benefits, including social cohesion, social capital, income equality, trust in institutions and democracy, and a reduction of crime and poverty (Descy, 2005).

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As a driving force for multiple sectors at the forefront of the global supply chain, the maritime industry has experienced various economic challenges, due to the global economy, oil prices, and the geopolitical situation. More recently, however, the maritime industry is facing new types of challenges: technological (e.g. automation and digitalisation), social (e.g. skills, employment and training), and environmental (e.g. energy efficiency and clean fuels). These contemporary changes are accelerating, and will affect countries and organisations, as well as individuals, on a global level. For example, technological challenges are driven by industry 4.0, including 5G and 6G technologies and automation processes, the development of smart and green shipping and logistics processes, and the use of big data (Ichimura et al., 2022). This trend is not only evident in industry, but also in our personal lives.

Today, our daily lives are increasingly connected to the digital world, through personal digital devices such as mobile phones and laptops. Increased connectivity brought by digitisation can create a range of social issues, such as skills, employment and careers. The WMU Report (2019) *Transport 2040: Automation, Technology and Employment – The Future of Work* highlights the fact that a high degree of adaptability to technological developments is important for maritime companies in business operations and human resource management. Meanwhile, such emerging challenges in the industry may be responded to differently from one generation to another.

Education can be seen as an instrument for solving various economic, social, cultural and political problems. However, the more complex modern societies become, the more changes are anticipated through ongoing societal, demographic, political, economic and technological processes, which impose serious adaptation-related challenges on education systems (Rado, 2020). The pressure on education systems and institutions of higher education has never been as strong as the present time, with societies faced with an accelerated pace of change.

One of the recent challenges faced by societies (and education systems) is the generation gap. A generation can be defined as individuals of a particular age group living at the same time and sharing common experiences, values, and a sense of identity (Roberts et al., 2012). As research shows, there are fundamental differences in the way different generations approach teaching and learning, proficiency in using digital technologies, and expectations for employment and career possibilities. With the spread of higher education, and with the continuous development of lifelong learning opportunities, institutions of higher education are facing a challenge to organise education by addressing the needs and preferences of different generations. To organise teaching and learning activities effectively (now and in the future), educational institutions need to understand the characteristics of the multi-generational population of students, and the tendencies in changes to the future student population. Thus, maritime education and training (MET), as a part of the education system, also need to take into account the characteristics of the future workforce, and the needs of the maritime industry, in terms of new challenges, such as technological change, sustainability goals, decarbonisation, and the blue economy, as well as mental health and well-being (Carrera-Arce et al., 2022). MET has to ensure the effective functioning of the maritime industry by preparing skilled professionals to be able to work in a changing environment (Baum-Talmor, Kitada, 2022), while taking into account the generational differences and individual characteristics of learners.

This paper presents an analysis of records of the student population at a maritime higher education institution called the World Maritime University (WMU) during the last five years, with a special focus on the characteristics of Generation Z students. A statistical analysis of the data has allowed us to identify differences in the characteristics of Generation Z students in the selection of study programmes, gender balance, and academic performance. The findings identified will be helpful in strategising the organisation of effective education to address the needs of the maritime industry, taking into account the characteristics of Generation Z students.

1. Understanding different generations

The concept of ‘generation’ is widely used in the academic world, and it helps us to describe groups of people who were born during the same period and have similar historical and cultural experiences, as ‘an identifiable group that share birth years, age, location and significant life events at critical developmental sta-

ges' (Tolbize, 2008). Generally, these groups of people have similar values, attitudes and behaviours, and they can be different in various aspects of life, including work values, the use of technologies, education, political views, attitudes toward diversity, family, social relationships, and so forth. There is no universally agreed-on set of birth years that define each generation. Generational categories and characteristics are also not fixed and absolute, and might overlap and vary across generations, since they might be influenced by different cultural backgrounds and experiences of living in a particular country. However, the following description of generations is widely accepted (Dimock, 2019; Pew Research Center, 2015; Abrams, von Frank, 2014):

- The Silent Generation, born between 1928 and 1945, experienced the Second World War and the post-war economic boom;
- Baby Boomers (Boomers), born between 1946 and 1964, experienced significant social and political changes, including civil right movements, the Vietnam War, and the rise of counter-culture;
- Generation X (Gen X), born between 1965 and 1980, experienced economic recession, the rise of technology and globalisation;
- Millennials (Gen Y), born between 1981 and 1996, experienced the development of information technologies (IT), the Internet, and the Great Recession;
- Zoomers (Gen Z), born between 1997 and 2012, the first generation to grow up entirely in the digital age, shaped by social media, online gaming, etc.

Scientists discuss different ways and attitudes towards the education of each generation (e.g. Helyer, Lee, 2012; Garcia, Qin, 2007). For example, Baby Boomers tend to value traditional education, leading to an academic degree. Gen X have a more pragmatic approach, and value practical skills and job training. Gen Y prefer experiential learning, and look for alternative kinds of education, such as short courses and the possibilities of lifelong learning. Gen Z are the most comfortable with IT compared to other generations, and might be considered as more entrepreneurial and creative in relation to education. Some differences in ways of collaboration and communication should also be considered: for example, Gen X might prefer face-to-face communication, while Gen Y and Z are more in favour of using social media and email. Understanding differences is helpful in organising educational activities. In the next sections, Generation Z will be focused on in more detail in relation to MET.

2. Generation Z as an agent of change

Generation Z is often highlighted in relation to digitalisation. They are digital natives, surrounded by the Internet, social networks and mobile systems (Francis, Hoefel, 2018). For them, traditional maritime knowledge and heritage are not just simple values, but also something to be challenged. Family-oriented small to medium-size companies, as a business model, however, may lack the flexibility to integrate new staff such as Generation Z, putting them at a disadvantage in competing with other emerging business leaders. This potential challenge that small to medium-size maritime business owners may face should be considered an advantage for Generation Z, who are good at new ventures and entrepreneurship.

Technological change is expected to reshape the future of work in this sector, driving a fundamental employment dynamic, in which traditional maritime jobs are replaced by higher value-added onshore jobs (European Commission, 2020). However, despite all the challenges, transport and the movement of goods and people will never stop meeting people's needs. Companies need to adapt to new situations and remain competitive, and maritime higher education can help build the capacity of maritime leaders of tomorrow (Bartusevičienė et al., 2021).

Generation Z has different expectations of employment and career possibilities, due to their particularities. In relation to employment, characteristics of Generation Z that differ significantly from those of their parents' and grandparents' generations should be mentioned (Demyen, 2019): 1) A great deal of flexibility in terms of the possibilities for professional conversion, meaning that after graduating from an educational programme, Generation Z can reorient themselves easily to another field, if the initial one does not fit plans for the future;

2) Members of Generation Z express their dissatisfaction more easily and show greater courage, being more informed about their rights compared to previous generations; 3) As the youngest generation in the labour market (the majority are a maximum 25 years old), they are exposed to the first experiences in work leading to more difficult adaptation; on the other hand, organisations have to face an infusion of a fresh workforce, with a new and different vision to that of previous generations, but which also has different expectations and aspirations. In other words, today's labour market is faced with intergenerational 'coexistence'. This process can often lead to conflict and generational misunderstandings. However, the study shows that cooperation between different age groups can lead not only to conflict but also to positive outcomes for the organisation. For example, Generation Z can bring additional benefits in solving an industry's recent major problems relating to information overload. This generation can be trained from an early stage to categorise a lot of information quickly (Sencila, Kalvaitiene, 2018). After observing the behaviour and attitudes of Generation Z in the workplace, researchers (Barnes & Noble College, 2015) found that:

- Generation Z will not act, even if it is in their personal interest.
- Personal contact is repressed by communication through modern technological devices.
- Generation Z always create relationships and put into proportion: time spent/ tasks performed.
- Generation Z want to be rewarded transparently for their real performance.
- Discussions about work performance should be on a regular basis.
- Generation Z has different work values, and it is not fair to judge them based on our assumptions. Age diversity is equally important for the future of the maritime industry to innovate and generate new ideas.

3. Educating Generation Z

The report by Barnes & Noble College (2015) also provides useful information about Generation Z in their learning style. The study shows that Generation Z students are able to thrive in any learning environment where they can demonstrate an aptitude for independence and the ability to learn by themselves. It was evident that Generation Z is different from previous generations, who often relied on friends and family, whereas Generation Z prefer to learn and research, and can take their own decisions based on that research. While being characterised as independent-minded and tech-savvy, Generation Z appeared to value face-to-face interaction and collaboration in learning. For them, there is no boundary between devices or online territories. Generation Z understand learning as one continuous, multifaceted, fully integrated experience that connects social, academic and professional interests. Whether working collaboratively or independently, the report shows that both older and younger teenagers prefer to learn by doing.

In the survey conducted by Barnes & Noble College (2015), more than half the respondents said they learn best by doing hands-on work, while 38% said they learn by watching. When it comes to learning in the classroom, respondents said they find classroom discussions most beneficial. Learning through problem examples was also high on the list, further confirming Generation Z's desire to learn by doing. Generation Z tends to be more financially driven than millennials, who are more likely to define success in terms of personal fulfilment rather than financial. However, Generation Z believes that a university education is the path to a good job, and cites the cost of education as one of their biggest concerns. Both generations want to achieve personal satisfaction with their education and career choices, but have different priorities for achieving that satisfaction: Generation Z want their future to reflect their very specific and personal interests, while Generation X want their education to be a good career choice, and Generation Y want it to reflect their personal interests.

Expectations of higher education are increasing, as the knowledge and skills of graduates in the industry matter. As quality educational services are the basis for future careers, an educational environment in the classroom needs to be created, so that representatives of the new generation can use their talents and abilities productively, taking into account their personal characteristics and aspirations as strengths. In addition, aspects of lifelong learning in the workplace are also important: the education of Generation Z needs to be tailored to take into account the characteristics of their cognitive activities (e.g. an average attention span of seven seconds, the ability to process multi-level data quickly using technology, high efficiency in

a multi-tasking environment), communication preferences (i.e. trusting social networks more than family, independence) (Beregovskaya, Grisheva, 2020), needs (i.e. for individual support), psychological aspects (i.e. flexibility, creativity and relevance of learning) (Cameron, Pagnattaro, 2017), and technical skills. It is necessary to adopt not only teaching and learning methods, but also styles of communication between actors in the educational process, forms of presentation of information, including the creation of new types of educational and methodological literature, and the active use of information and communication technologies, in order to create a practical educational environment that will enable success in future careers (Miller, 2019).

4. Generation Z in maritime education and training

Bearing everything in mind, it is vital for the maritime industry to attract young talent, in order to continue to innovate and adapt to new environments posed by the global challenges discussed earlier. This is true of all maritime stakeholders, including industry, government and academic institutions. Given the culture of the maritime industry, which is traditional in many ways, the industry needs to modernise, welcome new and diverse ideas and approaches, and attract a new generation with different values in work and life (Kitada, Bhirugnath-Bhookhun, 2019). In this respect, MET is the entry point for Generation Z to offer a variety of maritime courses, from navigation and engineering to logistics, and from naval architecture to leadership and management. Our question is, what maritime courses attract Generation Z, and how do they perform academically? This data is lacking in current MET institutions, while it is necessary to understand the needs and preferences of learning by Generation Z.

5. Methods

To understand the challenges of strategising the organisation of MET in terms of changes in the generations of students, the study investigated how different groups of generations were distributed across different maritime courses. The research adopted a case study approach to study a particular maritime higher education institution. The World Maritime University (WMU) is a postgraduate maritime university based in Sweden. A case study as a research method allows for understanding a social phenomenon in its depth and reality in a particular context, allowing for 'the singular, the particular, the unique' (Simons, 2009), and having the potential to see universal truth (Rule, John, 2015). The WMU has three campuses: in Malmö (Sweden), Shanghai and Dalian (China), providing courses in MSc, PhD, postgraduate and tailor-made professional development for maritime and ocean professionals working in the maritime sector, including administrations, port authorities, the coastguard, the navy, seafarers, shipping companies, logistics companies, classification societies, and maritime education and training institutions. Around 350 people graduate on a yearly basis. After graduation, students are expected to be leaders, and to contribute to their countries in terms of maritime safety, security and clean oceans. The WMU faculty is also diverse, with about 30 permanent and 70 visiting faculty members from different countries. Considering the diverse profiles of WMU students and faculty, studying the case of the WMU means a fair representation of different nationalities. Although the sample from each country is small, the data is not biased according to nationalities or continents.

The study adopted a quantitative analysis of data describing the student population at the WMU in the last five years (from 2018 to 2022). Descriptive and inferential statistics were used to make conclusions about the characteristics of Generation Z students in comparison with students of other generations. A descriptive statistical analysis was applied, with the purpose of justifying the validity of the research and investigating the differences between different age, gender and study programme groups, according to the different generations of students who enrolled and graduated. A histogram was drawn up to visualise and compare final grades (GPA) in different age groups. To assess the main tendencies and changes in the selection of the studies, the slope coefficient was used. Mathematically, slope refers to the measure of changes of linear function. If the course's selection ability has changes placed in a trendline , where the tendency of changes is presented by points on the line, the average annual changes could be presented by the slope coefficient (1):

$$Slope = \frac{\Delta y}{\Delta t} = \frac{y_{t+1} - y_t}{T_{t+1} - T_t} \quad (1)$$

A positive slope indicates that the trendline is moving upwards, and a comparison of different positive slopes of a course's selection will present the fastest change and the fastest increase in popularity in different age groups of students. A negative slope indicates a trendline moving downwards, and creates a possibility to identify courses which will not be popular in the near future, so some measures to attract students should be taken.

6. Results

This section presents the results of the data analysis of 1,590 records of students who graduated from the WMU in the last five years, from 2018 to 2022; some of them enrolled in 2015. The records cover data about students enrolled in the following educational programmes:

- MSc study programme in Malmö (Sweden), consisting of seven specialisations: MEM (Maritime Energy Management), MET (Maritime Education and Training), MLP (Maritime Law and Policy), MSEA (Maritime Safety and Environmental Administration), OSGM (Ocean Sustainability, Governance and Management), PM (Port Management), SML (Shipping Management and Logistics);
- MSc study programme in Shanghai (China): ITL (International Transport and Logistics);
- MSc study programme in Dalian (China): MSEM (Maritime Safety and Environmental Management);
- IMLI Mphil study programme in Malmö (Sweden): MLEP /MLOP (Master of Philosophy in International Maritime Law and Policy);
- Distance learning programmes:
- LLM (Master in International Maritime Law): IML (International Maritime Law), IMLD (International Maritime Law Postgraduate Diploma);
- PGD (Postgraduate Diploma Programs): EMM (Executive Maritime Management), ME/MEY (Maritime Energy), MI (Maritime Insurance), MIL (Maritime Insurance Law), MSS (Maritime Safety and Security).

Members of four generations graduated from the WMU in 2018 to 2022: most of the research sample (Figure 1) is represented by Generation Y (Millennials), with 975 people (61%); the second biggest group of graduates is Generation X, with 472 people (30%); Generation Z is in third place by number, it consists of 91 graduates (6%), and Boomers are represented by 52 people (3%).

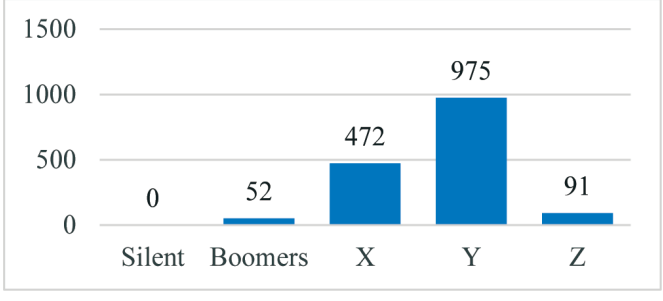

Figure 1. The distribution of WMU graduates in the last five years (2018 to 2022) by generation

As is shown in Fig. 2, the largest number of students who graduated from WMU during the last five years were born between 1981 and 2000 in China, they are mostly represented by Generation Y; this indicator has a tendency to grow. The dominant group of students born between 1971 and 1980 are from India, they represent Generation X. It should be mentioned that the greater part of Generation Z consists of students from China, born later than 1997.

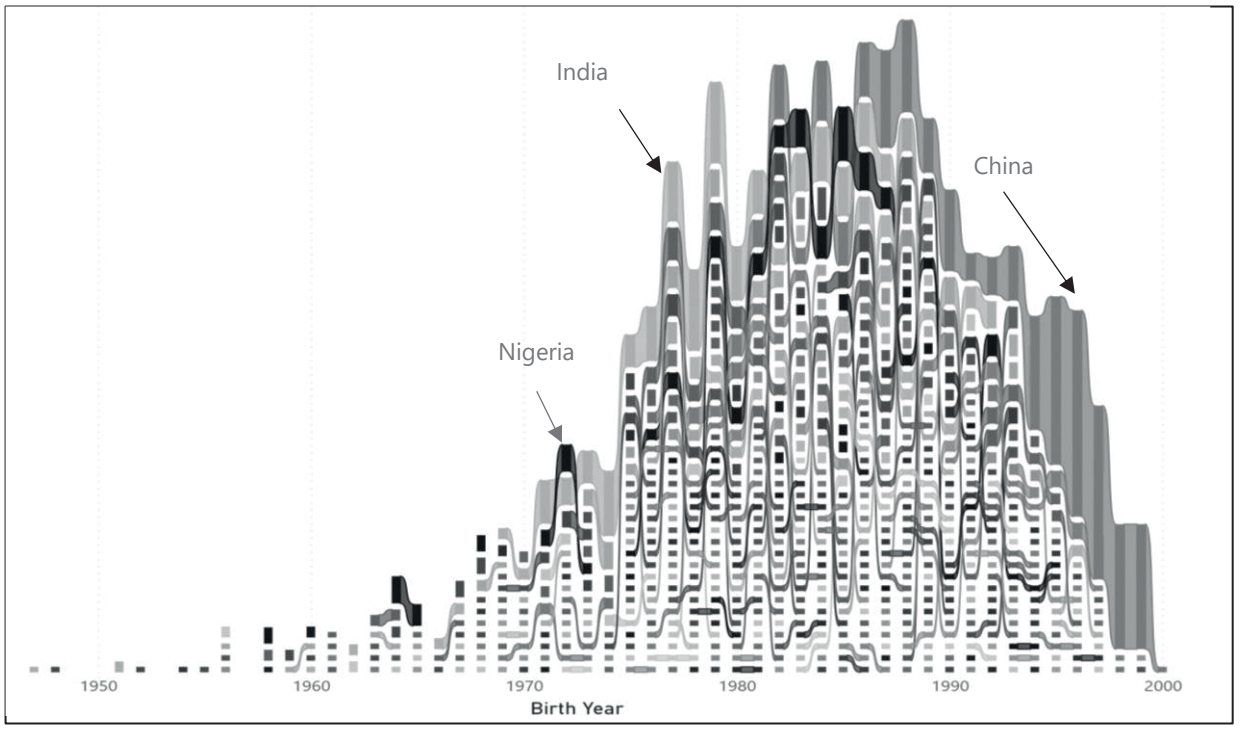

Fig. 2. The distribution of graduates by year of birth and country of origin

An analysis of the distribution of students by birth year and programme type (Fig. 3) reveals that most of the youngest students graduated in Shanghai. This new tendency has never been noticed before, and means that the biggest part of Generation Z students select the MSc study programme in Shanghai. In comparison with older students, it is noticeable that students who are born between 1960 and 1993 are more interested in the PGD programmes that are implemented remotely, but those programmes were not chosen by Generation Z at all. Most of the students born from 1975 to 1996 chose the MSc programme in Malmo. However, the data shows a sharp fall in numbers of Generation Z students in this programme.

The analysis of specialisations and their dependence on the birth year of students (Fig. 4) found similar tendences: Generation Z selects a particular specialisation, and this finding should be taken into account when developing courses. As is presented in the visualisation of distribution, IMLD was a very popular course in the age category from 1972 to 1993, and the distribution is wide in the context of the boundaries of students' ages. Some courses are more popular in smaller age groups: the EMM course was more popular in the age group from 1970 to 1980 (Gen X); MLP and MSEA were more attractive for those born from 1980 to 1988 (Gen Y). An analysis of specialisations in the youngest group of students found that the most popular course from 1994 was ITL, which was not identified in the older groups. Interestingly, the distribution of selecting the MSEM course was most popular in 1987 and 1988; in the older age group it was very fragmented, but in the group of Generation Z, the increase in choices is obvious. However, in the group of those born in 1999, the distribution in comparison with the ITL course is proportionately equal.

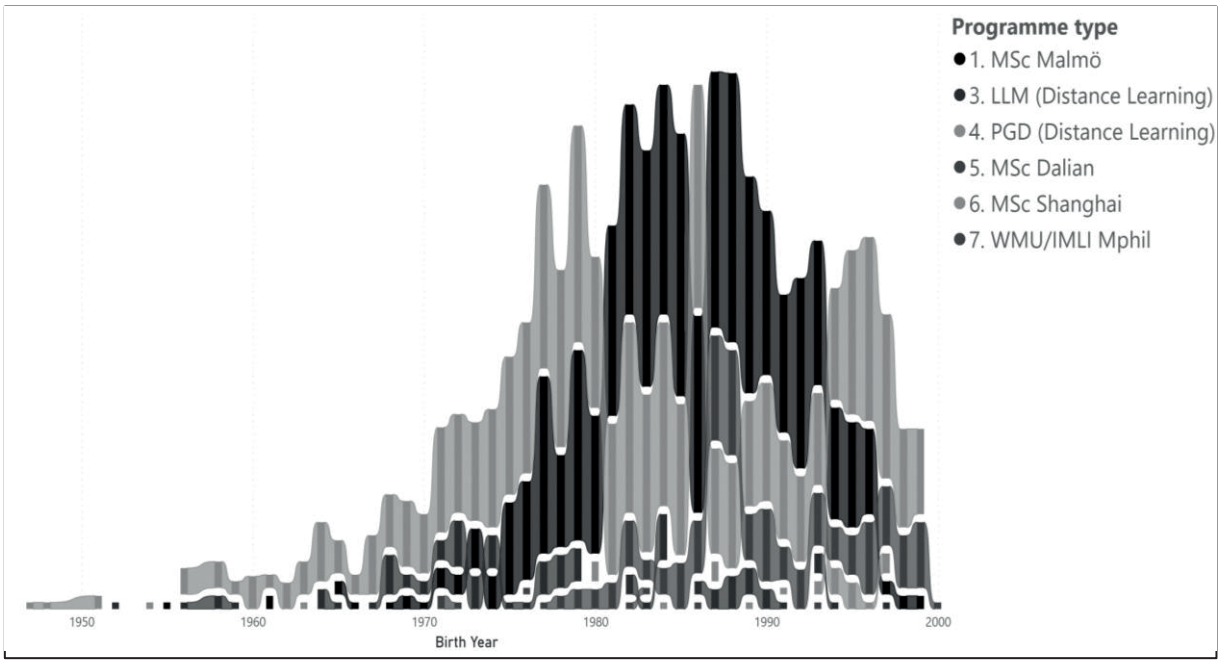

Figure 3. Student distribution by birth year and programme type

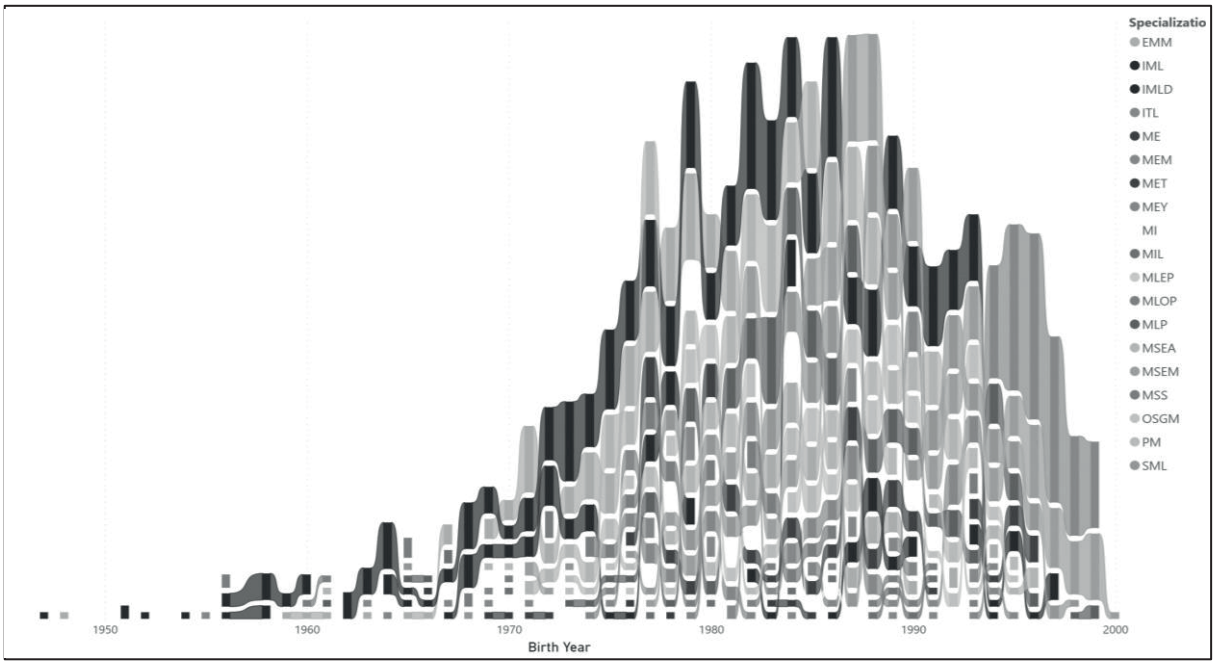

Figure 4. The distribution of graduates by birth year and course specialisation

The distribution of the 1,499 students in the research sample by enrolment on study programmes is presented in Fig. 5 (A, except Gen Z; B, Gen Z). It can be seen that the majority of Generation Z, 53 people (58%), were enrolled on the ITL study programme, while the most popular programme for the other student generations (except Z) was IMLD, which was chosen by 298 people (19.9%).

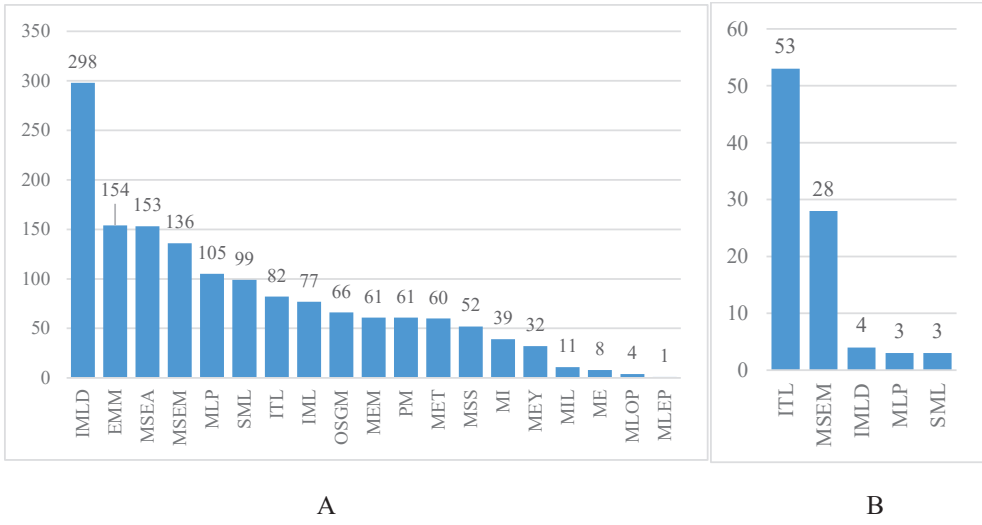

Figure 5. The distribution of graduates according to enrolment on study programmes

The enrolment of Generation Z on study programmes by enrolment years is presented in Table 1. There is a tendency for enrolment to ITL and MSEM to increase. The slope of enrolment for ITL is 7.1, while for the other generation groups in the sample (except Z), this coefficient is negative, at -6.6. This means that the popularity of this study programme is decreasing for the other generations, and increasing considerably for Generation Z. The other study programme worth considering is MSEM: the slope of enrolment on this programme is five, while for other generation students (except Z) it is only 1.9.

Table 1. Enrolment of Generation Z by year and study programme

Year	Total	IMLD	ITL	MLP	MSEM	SML
2018	3	1	1		1	
2019	16	1	10		5	
2020	29	2	21	1	4	1
2021	43	0	21	2	18	2
Slope			**7,1**		**5**	

The distribution of the research sample by gender is presented in Table 2. It is interesting that the numbers of female and male graduates of Generation Z are almost equal (male 55%; female 41%), while more than two thirds of graduates except Generation Z are male (male 71%; female 29%). This finding can be considered one of the most interesting, which means that the maritime industry, characterised as a male-dominated sector, might expect a more female pool of talent to supply the industry in following years.

Table 2. Graduate distribution by gender

Generation Z			Except Generation Z		
Male	50	55%	Male	1060	71%
Female	41	45%	Female	439	29%
Total (Z)	91		Total (except Z)	1499	

A comparison of Generation Z with other generations in relation to academic performance reveals the fact that Generation Z can be considered diligent and aiming to complete its studies: 95% of Generation Z students complete their studies; while only 77% of the other part of the research sample (except Z) recorded completion. The percentage of deferred, withdrawn and terminated studies in the latter part of the sample (except Z) confirms that almost a quarter of the students did not complete their studies (Fig. 6).

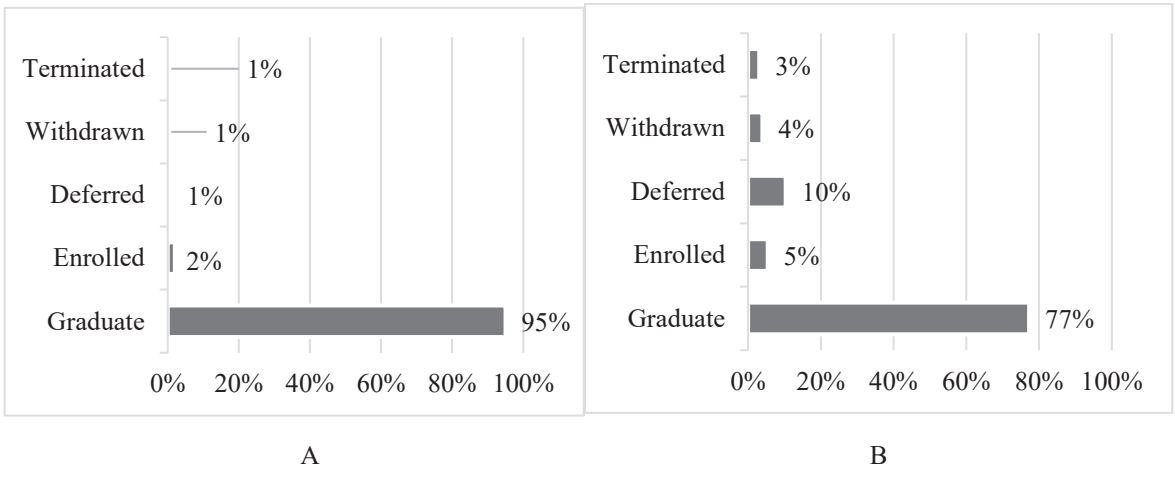

Figure 6. The distribution of records on the completion of studies (A, Gen Z; B, except Z)

The academic performance of the population of the research sample can be evaluated by analysing GPA (*grade point average), which indicates* the sum of grades on all courses divided by the total number of credits; the maximum GPA at the WMU is 4.0. The minimum GPA for Generation Z is 2.7, a little higher than for the other part of the sample (except Z, 2.67). The maximum GPA for Generation Z is 3.61; this indicator is lower than the maximum for the other part (except Z) of the sample, 3.89; the average GPA for Generation Z is 3.17, which is lower than for the other part (except Z) of the sample, 3.28. The distribution of GPA for Generation Z takes the form of normal distribution (Fig. 7).

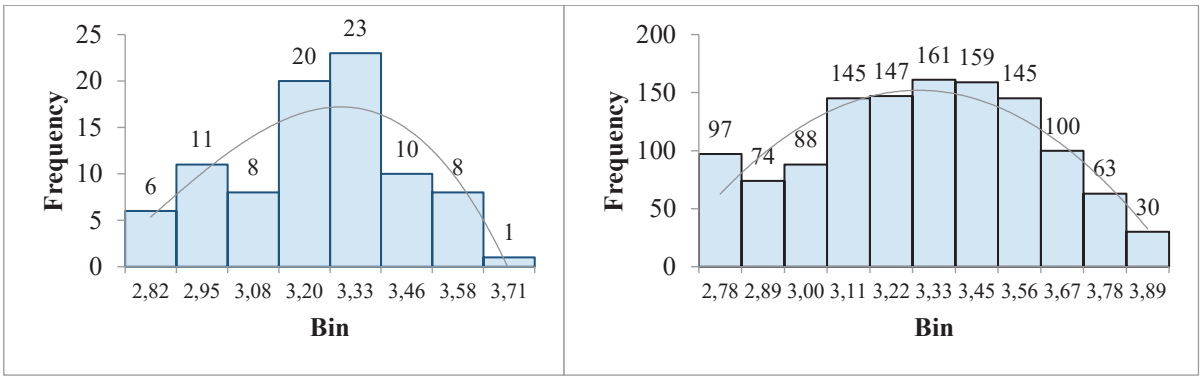

Figure 7. The distribution of GPA (A, Gen Z; B, except Z)

To sum up, the findings of the statistical analysis of 1,590 student records revealed differences between Generation Z and the other sample of the population (except Z), in terms of the selection and enrolment on study programmes, gender and academic performance. The finding can be used as a starting point in strategising educational activities at the WMU. In the next section, the results of statistical analysis are discussed.

7. Discussion

It should be mentioned that from 2018 from 2022, members of Generation Y were aged 22 to 41 years. Generation X were aged 42 to 57. Boomers were older than 58; while the age of members of Generation Z was below 21. It is obvious that Generation Z are just at the start of their careers, and Boomers are the most mature group in the research sample. Generation X and Generation Y are at an age to utilise lifelong learning possibilities to the greatest extent and benefit for the progression of their careers. At the same time, more possibilities are opening up for Generation Z, as can be seen in Fig. 1.

The distribution of the research sample by country (Fig. 2), by programme type (Fig. 3), and by specialisation (Fig. 4), demonstrates that the characteristics of Generation Z should be addressed with greater attention; for example, the MSc study programme in China, particularly ITL in Shanghai, was popular with Generation Z. This finding may be helpful, because the WMU must be prepared for the greater integration and utilisation of IT in the educational process, in order to meet the needs of Generation Z.

Another implication from the analysis is that Generation Z and Generation Y tend to choose distance-learning programmes and the MSc study programme in Malmö. Hence, it will be a strategically wise decision to consider the characteristics of different generations to be addressed in the same programmes and to use the targeted marketing strategies of the WMU's study programmes. On the other hand, it is evident that the WMU should expect to have mixed generations of students in one class in the MSc study programme in Malmö for the next 15 years. This implies that educational activities for mixed generations should be organised in a flexible way, addressing the different needs and qualities of various generations. This will pose a new challenge for academic staff. However, as was mentioned by Demyen (2019), cooperation between different age groups can be beneficial for the outcome of educational activities in preparation for 'intergenerational "coexistence"' in their careers. Such learning environments will reflect the realistic dynamics of the organisation as a workplace, and offer an opportunity to collaborate between generations.

There was an almost equal distribution of the research sample by gender in Generation Z (Table 2) in comparison with the rest of the research sample. Despite the maritime industry being male dominated, in future it may have more female specialists than today. This can be considered as a positive development for the industry.

Furthermore, the findings relating to the successful academic performance of Generation Z, in comparison with the other research sample, can also be considered as a positive insight into the competences of future professionals in the maritime industry.

Conclusions

Based on a statistical analysis of 1,590 student records of graduates from the WMU in 2018 to 2022 (enrolment in 2015 to 2022), the following conclusions can be formulated:

- the majority of WMU graduates in 2018 to 2022 consist of members of Generation Y; however, the numbers of Generation Z will increase in the next few years;
- the greatest number of students who graduated in the last five years were born in China in 1981 to 2000; the dominant group of students born from 1971 to 1980 are from India; the biggest group of the youngest students graduated in Shanghai;
- IMLD was a very popular course in the age category 1972 to 1993, and the distribution was wide in the context of the boundaries of students' ages. Some courses were more popular in some smaller age groups: the EMM course was more popular in the age group 1970 to 1980 (Gen X); MLP and MSEA was more attractive to those who were born between 1980 and 1988 (Gen Y);
- most Generation Z enrolled on the ITL study programme;
- the slope (linear trend calculation of annual growth average) of enrolment for ITL is 7.1 (for graduates except Gen Z it is negative, at -6.6);
- Generation Z can be considered as diligent and aiming to complete their studies;
- the distribution of Generation Z by gender was almost equal.

Findings from the statistical analysis of 1,590 student records revealed differences between Generation Z and the other sample of the population in relation to selection and enrolment on study programmes, gender and academic performance. Particular attention is paid to address the characteristics of Generation Z in educational processes, adjusting the MSc study programmes in China to the needs of Generation Z. An understanding of the characteristics of Generation Z will be helpful and strategic for MET institutions, and the findings of the statistical analysis can be considered as a starting point for strategising educational activities at the WMU.

The authors believe that the findings of the current research may have a strong practical value for the management, administrators, curriculum developers and faculty at the WMU. The characteristics of recent and future learners have to be taken into account when: 1) developing and organising teaching and learning activities by implementing possibilities for the application of rapidly developing IT in educational processes; 2) developing communication and marketing strategies by proper target-oriented communication channels in order to attract learners according to their needs and preferences; 3) providing necessary support for learners with special characteristics, including Generation Z, whose numbers will increase in the near future.

The case study at WMU is specific; however, similar case studies in other maritime higher education institutions would be helpful, and the results can be compared. This study only employed a quantitative analysis, and does not provide explanations as to why a particular generation may behave and act in a certain way. Future research should consider using both quantitative and qualitative methods to complement each other for in-depth analysis.

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Z KARTOS STUDENTŲ JŪRINIO ŠVIETIMO IR MOKYMO PERŽIŪRA

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Santrauka

Šalių ekonomika priklauso nuo darbo jėgos kompetencijų, kurios ugdomos esamose švietimo sistemose, todėl aukštojo mokslo institucijos šiame procese vaidina svarbų vaidmenį. Aukštasis mokslas tampa vis labiau masiniu, nuolat plečiamos mokymosi visą gyvenimą galimybės, tad aukštosioms mokykloms kyla iššūkių, kaip kokybiškai organizuoti edukacinį procesą, atsižvelgiant į skirtingų kartų poreikius ir pageidavimus. Tyrimai atskleidžia, kad skirtingos kartos turi skirtingus mokymosi pomėgius, poreikius, gyvenimo ir išsilavinimo tikslus. Kad mokymo ir mokymosi veikla būtų veiksmingai organizuota (dabar ir ateityje), švietimo įstaigos turi suvokti kelių kartų studentų populiacijos ypatumus ir būsimų studentų populiacijų kaitos tendencijas. Tie patys iššūkiai kyla ir rengiant jūrinio sektoriaus profesionalus, tad tuo užsiimančios institucijos turi atsižvelgti į būsimos darbo jėgos ypatybes bei jūrų pramonės poreikius, kurie susiję su naujais iššūkiais, pavyzdžiui, technologiniais pokyčiais, tvarumo tikslais, anglies dioksido mažinimu ir mėlynosios ekonomikos plėtra. Straipsnyje pateikiama Pasaulio jūrinio universiteto 1590 studentų duomenų įrašų, kurie daryti 2018–2022 metais, statistinė analizė, ypatingą dėmesį skiriant Z kartai. Remiantis statistinės analizės rezultatais, pateikiama įžvalgų dėl efektyvaus jūrinio sektoriaus profesionalų rengimo organizavimo ateityje.

Pagrindinės išvados:

- daugelis 2018–2022 m. Pasaulio jūrinio universiteto (angl. *World Maritime University* – WMU) absolventų yra Y kartos atstovai, tačiau ateinančiais metais Z kartos atstovų skaičius didės;
- daugiausia studentų, baigusių studijas per pastaruosius penkerius metus, yra gimę Kinijoje 1981–2000 m.; dominuojanti studentų, gimusių 1971–1980 m., grupė yra iš Indijos; didžioji dalis jauniausių studentų studijas baigė Šanchajuje;
- Z kartos atstovai dažiausia renkasi magistrantūros studijų programas Kinijoje;
- Z karta gali būti vertinama kaip stropi ir siekianti baigti studijas;
- Z kartos atstovų pasiskirstymas lyties aspektu yra beveik vienodas, tai išskiria juos iš kitos tyrimo populiacijos dalies, kur moteriškos lyties atstovių yra mažiau nei trečdalis.

Apibendrinant galima teigti, kad 1590 studentų įrašų statistinės analizės išvada atskleidė, kuo Z kartos atstovai skiriasi nuo kitos populiacijos imties atstovų. Esminiai skirtumai susiję su studijų pasirinkimu, pasiskirstymu lyties aspektu ir akademiniais rezultatais. Rengiant magistrantūros studijų programas Kinijoje ypatingas dėmesys turėtų būti skiriamas Z kartos poreikiams, atsižvelgiant į jos ypatybes ugdymo procese. Statistinės analizės rezultatai gali būti naudingi prognozuojant studentų populiacijos pokyčius ir bus panaudoti kaip atspirties taškas tobulinant WMU edukacinius procesus strateginiu valdymo lygmeniu.

Nors WMU atvejo analizė yra specifinė, panašių atvejų analizė kitose jūrinėse aukštosiose mokyklose būtų naudinga ir galima būtų palyginti rezultatus. Šiame tyrime taikyta tik kiekybinė analizė, kuri nepaaiškina, kodėl tam tikra karta gali elgtis ir elgiasi tam tikru būdu. Būsimuose tyrimuose galima būtų apsvarstyti galimybę taikyti tiek kiekybinius, tiek kokybinius metodus, kurie vienas kitą papildytų, siekiant atlikti išsamią analizę.

PAGRINDINIAI ŽODŽIAI: *jūrinio sektoriaus specialistų rengimas*, *Z karta*, *švietimas*, *siekiant darnaus vystymosi (ESD)*.

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