2025 Season

Duqm Now
Leading Change

EVENT REPORT 02

Classroom to Shop Floor

Education-Industry Links in Manufacturing

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We aspire to deliver impact with every post we make

بنقدم بثقة
Moving Forward with Confidence

رؤية عُمان 2040

What Are We Looking to Achieve?

Raise Awareness
Increase awareness of Duqm as an attractive investment destination – providing information on its infrastructure, amenities, incentives, tenants and benefits.

Promote Investment
Attract potential investors from different sectors and from various parts of the world, specifically those who could benefit from Duqm's unique offer.

Network Building
Provide a platform for stakeholders, existing tenants - large and small - potential investors and government representatives to network and build partnerships.

Facilitate Dialogue
Encourage open discussion about the opportunities available in Duqm, facilitate dialogue between businesses, investors, tenants and policy makers.

Showcase Success Stories
Importantly, share success stories of businesses operating in Duqm - showcase the opportunities and growth potential for other prospective tenants.

Knowledge Exchange
Create a knowledge-sharing platform where best practices, regulatory updates and industry trends can be discussed.

Strengthen International Ties
Enhance international ties and foster greater international cooperation by attracting foreign investors and businesses.

Sustainability Focus
Address sustainability issues related to Duqm's operations and highlight the initiatives taken by SEZAD towards eco-friendly practices.

Reserve your seat at
DuqmNow@duqm.gov.om

Session I

7:30pm Wednesday 5 February

Up & Down the Green Stream

Globally, small and medium-size enterprises (SMEs) are playing a major role in the Green Energy sector and enjoying substantial growth. In Europe, for example, SMEs involved in renewable energy projects have increased revenues by an average of 15% annually over the last five years while the global green tech and sustainability market is expected to reach US$139 billion by 2030.

Inspired by this potential, this Duqm Now session will explore the current and emerging renewable energy related opportunities for ambitious Omani SMEs and entrepreneurs in and around the Special Economic Zone at Duqm.
With a special focus on major projects like SEZAD's Integrated Energy Valley, we will cover the role SMEs can play in supply chain management, manufacturing, specialized services and support infrastructure.

Key Discussion Points

1. The role SMEs can play within major projects like SEZAD's integrated Energy Valley from supply chain contributions to providing specialized services.
2. Opportunities created by new technologies and innovative practices in renewable energy.
3. Trends in the global renewable energy market and potential revenue potential for SMEs engaged in renewable energy projects.
4. Duqm's SME support infrastructure and scaling operations within the renewable energy sector.
5. The broader implications of a thriving renewable energy sector on sustainability and community development in Duqm and Oman.

Reserve your seat at
DuqmNow@duqm.gov.om

Session 2

7:30pm Wednesday 16 April

Classroom to Shop Floor: Education-Industry Links in Manufacturing

In accordance with the goals of Oman Vision 2040 and through the roadmap provided by the newly announced Industrial Strategy 2040, government is looking to increase the 9.8% contribution manufacturing made to Oman's non-oil GDP in 2023. The growth of the sector will create thousands of quality, long-term jobs for Oman's youth and central to equipping them with the skills they need to embark on and succeed in these careers will be collaborative University-Industry (U-I) programs. In fact, research suggests companies engaged in U-I arrangements report a 11% higher rate of productivity with the flow of new ideas and technologies from academia to the production floor, significantly boosting competitiveness. For Duqm's tenant community these links have the potential to provide crucial support, enhancing technical capabilities and market responsiveness through access to tailored training programs and research.

This Duqm Now will delve into the fabric of both successful U-I partnerships and apprenticeships, looking at how they can bridge the gap between theoretical knowledge and practical application.

Key Discussion Points

1. Collaboration models between universities and industry, apprenticeships and research.
2. Successful partnerships between manufacturers and universities - case studies, outcomes, best practices and lessons learnt.
3. Gaps in the current skill sets of graduates and how industry input can tailor educational programs to better meet Duqm's workforce demands.
4. The integration of advanced manufacturing technologies into academic curricula and preparing students for the modern manufacturing environment.
5. Funding opportunities and resources available for educational institutions and manufacturing firms to establish and maintain productive partnerships.

Reserve your seat at **DuqmNow@duqm.gov.om**

Session 3

7:30pm Wednesday 17 September

Circular Economy: Rethinking Resource Use

The Circular Economy is all about moving away from the traditional, linear "take-make-waste" model and instead keep products and materials in use. For many companies, this shift in thinking may initially seem daunting - after all, some operate on slim margins, limited resources and complex supply chains. By simply reevaluating byproducts and waste streams as potential resources, firms can simultaneously cut costs, generate new revenue and gain a competitive advantage - essentially turning waste from a cost centre into a profit driver.

By embracing the Circular Economy, SEZAD businesses can reap substantial benefits - not just for themselves but also for the planet and its inhabitants.

This third Duqm Now will discuss how embracing circularity in manufacturing is not just a sustainability imperative for SEZAD's community but a high-potential business opportunity. It will look too at what is involved in embarking on this shift, its challenges, support available and rewards.

Key Discussion Points

1. Advanced waste management technologies and practices.
2. Strategies for maximizing resource efficiency in manufacturing processes.
3. Methods for extending the lifecycle of products and their potential impact on Duqm's industrial sector.
4. Opportunities for collaboration between business, government and other stakeholders to promote and support sustainable manufacturing practices in Duqm's industrial sector.
5. Challenges for Duqm-based businesses in transitioning to a Circular Economy model.

Reserve your seat at **DuqmNow@duqm.gov.om**

Session 4

7:30pm Wednesday 10 December

A Greener Petrochemical Pipeline

Despite environmental challenges - including greenhouse gas emissions and plastic waste – and pressure from regulators, customers and investors to decarbonize, the global demand for petrochemicals is projected to double by 2050. This anticipated growth, driven by increased population, urbanization and rising living standards, underscores the urgent need for innovative and sustainable practices in the petrochemical industry.

Taking a fresh look at the petrochemical industry, this expert Duqm Now panel will explore the transition to low carbon petrochemicals including innovations such as process optimization, waste heat recovery, the creation of biodegradable plastics and the shift towards a Circular Economy for these products. The conversation will include discussion on the economic benefits and potential for job creation of these approaches. We will also investigate how the petrochemicals industry is evolving in Duqm and what the next steps will be as Oman works towards its 2050 Net Zero Target.

Key Discussion Points

1. The transition to bio-based and renewable feedstocks and decreasing reliance on traditional fossil fuels in petrochemical production.
2. New technologies and methods for enhancing efficiency in petrochemical processes.
3. Strategies to create a more sustainable lifecycle for plastics.
4. Economic benefits and job creation potential associated with implementing sustainable practices within the petrochemical sector.
5. Major industry environmental challenges and strategies to mitigate these impacts as the global demand for petrochemicals continues to rise.

Duqm Now

Education-Industry Collaboration Top Class Move

Sponsored by Duqm Quarries and Development Bank, the 2nd Duqm Now session, Classroom to Shop Floor: Education-Industry Links in Manufacturing held at the Crowne Plaza Hotel Duqm, 16 April brought together key figures from Oman's education and industry community.

In accordance with the goals of Oman Vision 2040 and through the roadmap provided by the recently announced Industrial Strategy, government is looking to increase the 10.5% contribution manufacturing made to Oman's non-oil GDP in 2024. The growth of the sector will create thousands of quality, long-term jobs for Oman's youth and central to equipping them with the skills they need to embark on and succeed in these careers will be collaborative University-Industry (U-I) programs. In fact, research suggests companies engaged in U-I arrangements report a 11% higher rate of productivity with the flow of new ideas and technologies from academia to the production floor, significantly boosting competitiveness.

Moderated by
Dr. Mohamed Al Mughairi
Petroleum Engineering Commercialization Manager
PDO

HH Sayyid Dr. Adham Al Said
Co-founder
The Firm

Professor Salim Al Harthi
Deputy Vice-Chancellor
Sultan Qabooos University

Essam Al Sheibany
VP Sustainability
ASYAD Group

In this Duqm Now interview, Eng. Ahmed Akaak, CEO, SEZAD offers practical insights on bridging the gap between education and industry. He discusses how targeted collaboration is essential for developing the skilled workforce needed to drive Oman Vision 2040, the challenges of preparing students for rapidly evolving industries and the innovative partnerships already showing promising results.

Eng. Ahmed Akaak
CEO
SEZAD

How do you see education and industry working together to support Oman's economic diversification, particularly in Duqm?

In Duqm, we're building an economy driven by innovation – but this depends on people having both technical skills and a passion for continuous learning. That's why we're bringing education and industry together to talk about what skills are actually needed. It's simple - when schools and universities understand what businesses require, everyone benefits. Students develop the relevant skills and companies find qualified talent.

And this isn't just theoretical - the economic impact of these partnerships is measurable. Take Australia, for example, where formal industry-university collaborations generate major returns. They bring in about US$6.6 billion annually for firms partnering with universities, while the overall impact on the national economy is even greater - contributing around US$12.2 billion and creating an estimated extra 30,000 full-time jobs.

This shows us that when education and industry work together, results can be impressive.

Looking beyond the economic contribution, there are educational models worth mentioning. South Korea's Meister Schools, for example, are high-performing vocational institutions with curriculums developed in partnership with industry. About 70% of the learning is hands-on with the remaining 30% dedicated to foundational academic subjects. Students are trained in industries such as robotics, electronics, biotechnology, automotive engineering and more. And they achieve impressive employment rates among graduates - often exceeding 90% - helping South Korea maintain its reputation as a global manufacturing powerhouse. Similarly, Singapore's SkillsFuture initiative brings government, businesses and schools together to promote lifelong learning which has led to an increase in workforce participation in continuing education.

For Duqm specifically, internships are a priority. By giving Omani students real experience in manufacturing, we develop their practical skills while helping our tenants identify promising talent. I am also keen on creating spaces where start-ups, researchers and established firms can collaborate together - this kind of cross-pollination sparks innovation. At the end of the day, it's not just about producing graduates – it's about developing people who can think creatively, solve complex challenges and drive Oman's economic transformation forward.

I must say I am encouraged by some of the innovative partnerships we're seeing emerge. Take the Oman Cables Industry – Ministry of Education Kids in STEM program, for example. Teaching children aged 6 to 10 to program robots, design wind turbines and understand electrical basics. What makes initiatives like this so powerful is they build a pipeline of talent. When industry engages at all levels of education - from primary through tertiary - we create opportunities that benefit everyone.

What are the key factors influencing education-industry collaboration in Oman?

The relationship between education and industry is most certainly heading in the right direction, largely driven by Oman Vision 2040. We're focused on building a knowledge-based economy which means aligning our educational priorities with strategic sectors like advanced manufacturing, logistics, renewables, mining, tourism and fisheries.

Probably the biggest challenge we face is keeping pace with change. Industry evolves quickly these days, while academic institutions typically move more deliberately. This creates a natural tension - we need to find ways to prepare graduates for jobs that are evolving even as they're studying.

Why are education-industry collaborations so important and what makes them successful?

As mentioned earlier, education-industry collaborations create win-win outcomes for all involved. Companies gain access to expertise and research that fuels innovation. Universities stay connected with real-world needs and secure new revenue streams. Most importantly, students develop practical skills that bridge theoretical knowledge and practical application.

In my experience, successful collaborations require open communication, mutual respect and a shared vision for innovation. The Dyson Centre for Engineering Design at Cambridge University is a perfect example of this - providing space for over 1,200 engineering students to access specialized equipment like 3D printers, scanners and lasers. This open-plan environment fosters collaboration on innovative projects ranging from solar-powered racing cars to helium balloon spaceflight systems.

This same collaborative model is what we're looking to adopt in Duqm. An approach that ensures education prepares students for future challenges while helping our tenants maintain competitiveness. Ultimately, these partnerships harness knowledge and innovation to solve real-world problems, building a more resilient and innovative economy that benefits everyone.

Globally, concerns are rising about a widening skills gap. Reports suggest millions of manufacturing jobs could go unfilled due to a lack of qualified workers.

The skills shortage in manufacturing is a global challenge. Research highlights the urgency - by 2030 the sector could face a talent deficit of 7.9 million workers worldwide. In the US, Deloitte predicts 2.1 million unfilled jobs, potentially costing US$1 trillion annually. While according to an EIT Manufacturing study 63% of EU SMEs struggle to find employees with the required skills. To address this, manufacturers need to focus on reskilling and upskilling staff advanced technologies while collaborating with schools and universities to develop future talent. By taking a proactive approach to this challenge, we don't just solve a problem, we create opportunities for growth and innovation that will help us thrive in today's rapidly changing manufacturing space.

63%

Of EU SMEs struggle to find employees with the required skills

Many still view manufacturing as dirty, dumb and dangerous which makes attracting young Omani talent a challenge. How can we change these perceptions and draw the next generation into the sector?

The first step is to tackle these outdated stereotypes head-on. Manufacturing on SEZAD is far from dirty, dumb or dangerous – it's a high-tech, innovative industry. In fact, many of our tenant facilities resemble clean rooms with advanced technologies like robotics and automation driving operations. Highlighting these realities can help change perceptions.

We also need to engage our youth early. Research shows that 27% of young people wouldn't consider manufacturing because they don't know enough about the careers available. Offering internships, apprenticeships and work experience programs - starting as early as high school - can help showcase the creativity and problem-solving skills required in modern Omani manufacturing.

Additionally, involving parents in the conversation is an absolute must. Interestingly, a survey of 2,000 UK parents revealed that despite placing a high value on the role of manufacturing only 19% of parents would encourage their children to work in the sector. By promoting success stories and emphasizing rewarding career opportunities we can make manufacturing an exciting and aspirational choice for Oman's ambitious youth.

How is technology transforming the manufacturing sector and what steps are being taken to prepare the workforce for Industry 4.0?

Technology is fundamentally reshaping manufacturing. Industry 4.0 technologies - IoT, AI and automation - are enabling us to optimize processes and drive innovation like never before. The numbers tell the story - the manufacturing analytics market alone is projected to grow from US$8.4 billion in 2021 to US$28.4 billion by 2026. That's the pace we're dealing with.

But what matters most is people. In Duqm, our tenants are committed to equipping employees with the skills to thrive in this new landscape - training in data analytics, robotics and advanced manufacturing techniques. And as I mentioned earlier, the key to this is industry–education collaboration. I've seen great examples of this, like at University West in Sweden. They've partnered with manufacturers to co-design their Engineering Master's program using a Plan-Do-Study-Act approach. Companies host visits, provide guest lecturers and supervise internships. Students learn practical skills like friction stir welding and non-destructive testing that are immediately applicable. When education and industry work together, it's win-win.

US$28bn

The manufacturing analytics market will grow by 2026

How do you see education and industry collaborating in Duqm's future and what specific role will SEZAD play in facilitating this partnership?

My ambition is a seamless partnership between education and industry - one where the two work hand-in-hand to drive innovation and economic growth. In my opinion, education shouldn't just prepare students for today's jobs but actively collaborate with industry to develop the skills needed for tomorrow.

Educational facilities are on our radar – particularly those that focus on strategic areas aligned with Oman Vision 2040, including manufacturing, renewables, logistics, fisheries and tourism. We're keen to ensure young Omani talent has access to the kind of training they require to make the most of the career opportunities that are opening up here in Duqm.

Why Education-Industry Collaboration Matters

- **Fresh Expertise**
  Tap into specialist knowledge without hiring a full in-house team
- **Shared Innovation Costs**
  Split expenses with partners, making new ideas more affordable to develop
- **Faster Market Launch**
  Speed up development time by combining resources and knowledge
- **Idea Factory**
  Gain access to a continuous stream of fresh perspectives and creative solutions
- **Smarter Risk Management**
  Share both technical and business risks with your university partner
- **Reality Check**
  Get honest outside perspectives on which projects are worth pursuing
- **Talent Pipeline**
  Connect with promising graduates who bring new energy to your field

Bridging the Gap

As Oman expands its manufacturing sector, building strong connections between education and industry is critical. This collaboration is key to developing a skilled and adaptable workforce, driving innovation and maintaining competitiveness. The need for action is pressing - forecasts indicate millions of manufacturing jobs may go unfilled worldwide by 2030 due to skill shortages. While there's broad consensus on the importance of collaboration, obstacles stand in the way. This report gives an overview of these challenges and provides some practical solutions for schools and universities to forge stronger links with industry, ultimately creating effective partnerships that benefit both parties.

The Big Barriers

HH Sayyid Dr. Adham Al Said, Co-founder, The Firm

The gap between what students learn and what industry needs is holding us back, with global evidence pointing to a serious skills crisis. The World Economic Forum's Future of Jobs Report 2025 drops a bombshell - skill gaps are considered the biggest barrier to business transformation with 63% of employers identifying them as a major obstacle over the 2025-30 period. "It's not investment capital, it's not regulations – it's really skill gaps that are hindering being ready for future markets," the report emphasizes.

WORLD ECONOMIC FORUM

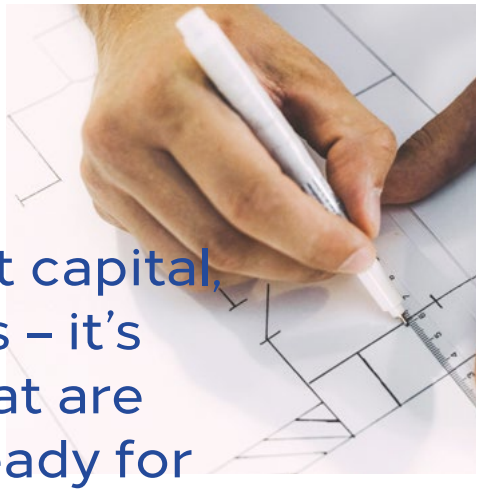
This skills challenge has prompted aggressive workforce planning strategies. Accordingly, 85% of employers surveyed plan to prioritize upskilling their workforce with 70% expecting to hire staff with new skills, 40% planning to reduce staff as they become less relevant and 50% planning to transition staff from declining to growing roles.

7mn

Workers won't have the skills their jobs demand by 2030

The manufacturing sector illustrates this problem clearly. Manufacturers often remark they struggle to find people with the right skills, limiting their ability to innovate, adopt new technologies and stay competitive. The UK Industrial Strategy Council paints a worrying picture – by 2030, roughly 7 million workers won't have the skills their jobs demand with the biggest gaps in technical and digital abilities.

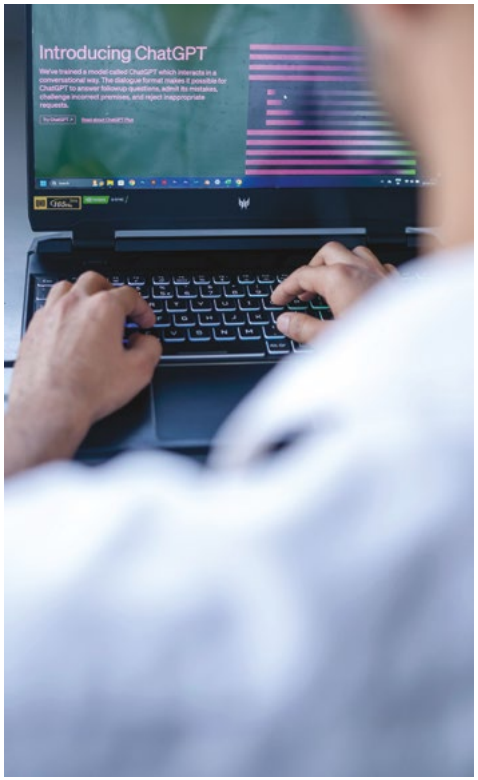
Importantly, addressing these gaps aligns with employee preferences. Research has found that many employees don't feel prepared for the future and believe more training from their employers would help. In fact, training and professional development is their number one request - ahead of more compensation.



It's not investment capital, it's not regulations – it's really **skill gaps** that are hindering being ready for future markets

Future Workforce Trends 2025-30

The Future of Jobs 2025 Report provides valuable insights into emerging workforce trends. Based on comprehensive research surveying over 1,000 employers across 22 industries in 55 economies – representing approximately 14 million workers globally - the report identifies five major trends driving both job creation and displacement in today's rapidly evolving labour market.



5 Trends Driving Workforce Transformation

Geoeconomic Fragmentation
In today's fragmented global landscape, trade has become a strategic battlefield. From tariffs and sanctions to supply chain disruptions, economic tools are increasingly used to reshape geopolitical dynamics. The rise of trade tensions - particularly between the US and China - is reshaping global commerce, drawing in nations across the Global South. Employers who expect geoeconomic trends to transform their business are more likely to offshore – and even more likely to re-shore – operations.

1

Demographic Shifts
People entering and exiting the workforce create dynamic changes. Young workers entering creates new opportunities, while workers retiring results in vacant positions. This trend generally drives more job creation than elimination.

2

Green Transition
According to the International Labour Organization the green transition is estimated to lead to 25 million net new jobs globally.

3

Economic Uncertainty
Fluctuating market conditions and unpredictable business cycles are reshaping workforce needs across sectors. Organizations are responding with more flexible employment models, including contract and project-based roles.

4

Technological Change
The most consequential factor leading to job creation and loss. Overall, this trend is creating more opportunities than it eliminates, largely due to broader access to technology, automation and AI.

5

Engineering Shortfall

◆ Essam Al Sheibany, VP Sustainability, ASYAD Group

The engineering profession faces a growing talent gap across countries and sectors. According to an analysis by Boston Consulting Group of US Bureau of Labor Statistics (BLS) data, the US alone will need approximately 400,000 new engineers annually, with nearly one in three engineering roles projected to remain unfilled each year through 2030. This shortage isn't just an American phenomenon - it represents a global challenge affecting innovation and economic growth worldwide.

BCG

FACTS & FIGURES

13%

Further BLS projections reinforce this concern, estimating a cumulative shortfall of 6 million in the engineering workforce between 2016 and 2026. The agency also forecasts a 13% increase in engineering employment from 2023 to 2031 highlighting the accelerating demand for these professionals across industries.

200,000

Beyond the US other developed economies face similar challenges. Research from Australia presents a concerning forecast with modeling predicting a skills shortage of 200,000 engineers by 2040 based on estimated attrition rates and the proportion of domestic graduates entering the workforce.
This projection suggests the engineering shortage is a long-term structural issue rather than a temporary imbalance.

Why the Shortage

- Demographic shifts in the workforce as experienced engineers retire
- Insufficient numbers of students pursuing engineering education
- Underutilization of qualified engineers - only 66% of Australian-born engineers and 49% of overseas-born engineers work in engineering roles
- Misalignment between engineering education and industry's evolving needs

STEM Education & Careers

Professor Salim Al Harthi, Deputy Vice-Chancellor, Sultan Qaboos University

The outlook for STEM careers remains strong with growth rates outpacing other sectors. According to US Bureau of Labor Statistics, STEM occupations are projected to grow by 10.4% between 2023 and 2033 compared to just 4.0% for all occupations. This difference underscores the growing importance of STEM skills in today's economy.

UNESCO's Institute for Statistics reveals distinct regional patterns in STEM education. Malaysia and Tunisia lead globally with approximately 43.5% and 40% of tertiary students earning STEM degrees. The Arab world, Eastern Europe and East Asia consistently produce higher proportions of STEM graduates. North African nations - Algeria, Mauritania and Morocco - all report STEM graduation rates above 29%, largely due to the popularity of computer engineering education. GCC countries, focused on economic diversification, also show strong performance – Oman's National Centre for Statistics & Information reports 8,480 students - 32.7% of all graduates - completed STEM degrees during 2022-23.

Other countries with strong STEM representation include Germany, Belarus and South Korea - all producing more than 30% STEM graduates. While India's STEM graduation rate is 34%, producing the highest total number of graduates due to its population of 1.4 billion. In contrast, Western Europe - except Germany - and the Americas show lower STEM graduation rates. The UK reports only 26% of graduates from STEM courses, with France at 25% and Spain at 23%. The Americas lag further behind with the US and Brazil producing just 19.6% and 17.5% STEM graduates.

32.7%

Students of all graduates - completed STEM degrees during 2022-23 in Oman

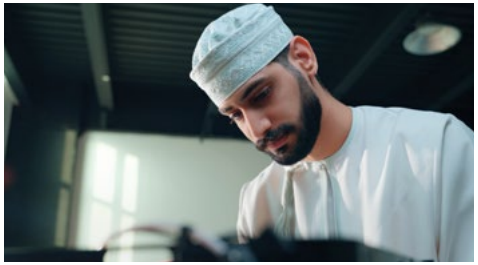
Show Me the Money

A recent Global STEM Salary Survey by New Scientist Jobs conducted with specialist recruitment firm SRG, reveals noteworthy trends in the scientific, clinical, engineering and tech sectors. Drawing from 4,000 professionals worldwide the survey shows record-breaking salary increases across regions.

In the UK, average STEM salaries reached £51,942 (US$69,425) a 13.1% increase from the previous year. European professionals saw an even larger jump of 18.7%, bringing average earnings to €62,877 (US$71,540) North American STEM workers now earn an average of US$84,571 reflecting a more modest 5.5% year-on-year growth. Despite these positive trends, the survey highlights a persistent gender pay gap across all regions with the disparity most pronounced among professionals aged 45-54.

Education-to-Work Transition

Despite strong career prospects, many graduates report feeling underprepared for the transition from education to the workforce. A comprehensive Prospects Early Careers Survey from 2024, which gathered data from more than 6,000+ students and graduates found that 32% felt unprepared for employment.

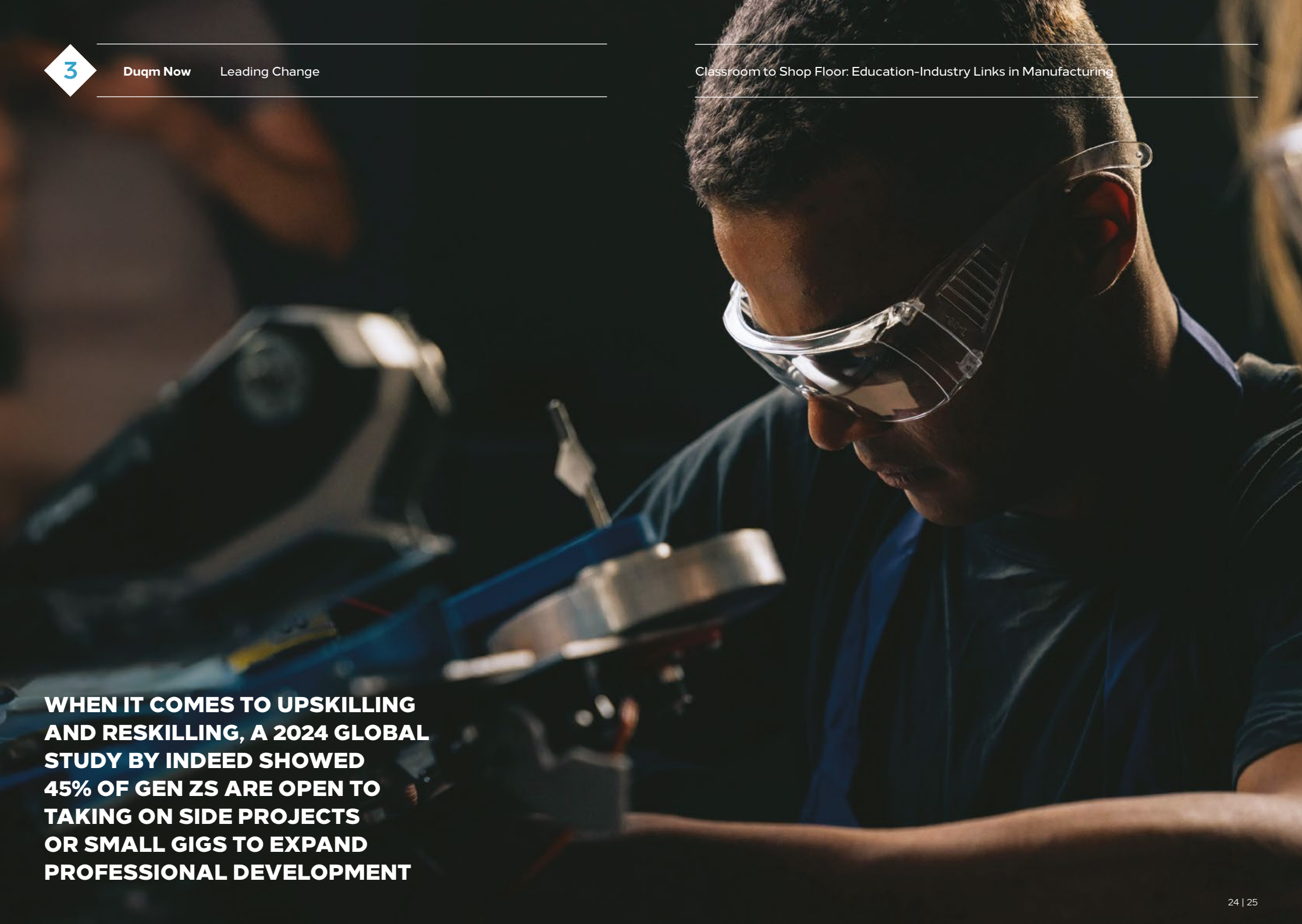


32%

Of students and graduates felt unprepared for employment

Barriers to Employment: UK Snapshot

When asked to rank the top three barriers preventing young people from finding a job in the UK today, the most commonly cited barrier by young people was a lack of training, skills or work experience, noted by around four in ten. The second most cited barrier for nearly two-fifths of young people is low wages, followed by a third referencing a lack of support to access employment, such as reasonable adjustments or flexible working patterns. 32% of young people also believe that poor mental health is a barrier to entering the world of work alongside a lack of vacancies at the appropriate skill level.



WHEN IT COMES TO UPSKILLING AND RESKILLING, A 2024 GLOBAL STUDY BY INDEED SHOWED 45% OF GEN ZS ARE OPEN TO TAKING ON SIDE PROJECTS OR SMALL GIGS TO EXPAND PROFESSIONAL DEVELOPMENT

Automation & Future of Work

Eng. Ahmed Akaak, CEO, SEZAD

The rise of automation and AI presents both challenges and opportunities for Oman's workforce. According to McKinsey Global Institute research, while approximately half of all work activities globally have the technical potential to be automated using currently demonstrated technologies, the actual proportion of work displacedby 2030 will likely be lower due to various technical, economic and social factors affecting adoption.

McKinsey & Company

FACTS & FIGURES

800 mn

McKinsey's analysis suggests between almost zero and 30% of the hours worked globally could be automated by 2030. In absolute terms, this could affect up to 800 million workers globally - including approximately one-third of the workforce in countries like the US and Germany.

60%

Artificial intelligence is expected to fundamentally transform the global workforce by 2050, according to reports from PwC, McKinsey and the World Economic Forum. Estimates suggest that up to 60% of current jobs will require significant adaptation due to AI.

86%

Driving Change

Technology adoption is clearly accelerating with 86% of employers expecting AI and big data analytics to drive transformation in their businesses. This technological shift is creating increased demand for AI engineers, cybersecurity experts and automation specialists while simultaneously reducing demand for administrative and clerical roles.

Climate initiatives are also reshaping the employment landscape with 47% of businesses expecting climate-change mitigation to impact their workforce strategy. This transition is driving growth in renewable energy, sustainability and environmental consulting sectors with particular demand for electric and autonomous vehicle specialists, environmental engineers and renewable energy experts.

Education Meets Industry

Manal Al Kiyoumi, Acting VP, Corporate Affairs, OQ8

The data demonstrates a pressing need for stronger alignment between education and industry. Effective partnerships can address both the quantitative shortage of engineers and STEM professionals as well as the qualitative gaps in skills and workplace readiness.

By fostering collaborative approaches that combine theoretical knowledge with practical experience, education-industry partnerships prepare graduates for today's evolving workplace demands. This approach benefits not only students but also enhances Oman's competitiveness and economic growth by ensuring a steady pipeline of appropriately skilled talent.

This intervention is particularly crucial given the evidence confirming challenges in the engineering and STEM workforce pipeline. The projected shortage through 2030 poses a risk to Omani manufacturing, the country's energy transition and broader economic development - while graduates continue to report feeling underprepared despite rising workplace complexity due to automation and AI.

Addressing these interconnected challenges requires coordinated action from education, industry and policymakers. Through strengthening connections between these sectors, developing relevant curricula, expanding work-based learning and supporting continuous professional development, stakeholders can bridge the gap between workforce supply and demand while better preparing Oman's youth for success in technical fields.

Ahmed Al Naamani, Director, Social Protection Fund, Al Wusta Region

School-Industry Partnerships

Schools face a key challenge - how to spark early interest in manufacturing careers and give students the foundational skills and knowledge they need to pursue these paths. This means breaking down traditional subject silos and embracing a more hands-on, real-world approach to learning.

Challenges

Expanding Learning Opportunities

Student access to comprehensive STEM education varies across communities. By investing in broader teacher development programs and modernizing learning resources we can ensure more students discover the diverse career possibilities in manufacturing and engineering. Engineering UK's 2023 report demonstrates that expanding advanced STEM subject offerings can increase pathways into engineering careers by up to 30%. While the OECD's Program for International Student Assessment studies highlight how targeted educational support can help students reach their full potential in STEM subjects regardless of background. Addressing these educational opportunity differences will boost social mobility and ensure all students can access rewarding careers in these growing fields.

Mums & Dads

How do we get parents and community members on board when many know little about STEM careers or still think of manufacturing as dirty, dumb and dangerous? A recent Institution of Engineering and Technology survey found 72% of parents feel they don't know enough about engineering careers to support their children's interest and 45% still hold outdated views of manufacturing. Breaking through these misconceptions is essential if we want to broaden student horizons and build a supportive ecosystem for STEM education.

Experiential Learning

Too many students miss out on meaningful work experience because of where they live or practical challenges in arranging placements. The Gatsby Benchmarks evaluation found just 37% of UK schools are hitting the target for meaningful encounters with employers and employees, with rural and disadvantaged areas facing the biggest hurdles. Without these real-world experiences, students struggle to make informed career choices.

37%

Of UK schools are hitting the target for meaningful encounters with employers and employees

The Gatsby Benchmarks evaluation

Case Studies

The Siemens Technology Virtual Work Experience Program

Launched in 2020, the program provides students with remote access to explore manufacturing careers and engage with industry professionals. Having reached over 75,000 UK students with 68% saying they're more interested in engineering careers and 82% showing better understanding of the digital skills modern manufacturing requires. Participants connect with Siemens experts to learn about the company's core focuses including digitalization, climate action, smart infrastructure and diversity and inclusion while discovering various career paths and entry opportunities through apprenticeships, internships and graduate schemes. The program also serves as an accessible stepping stone to more hands-on experiences, building essential skills in communication, teamwork and problem-solving regardless of a student's geographic location.

Zahran Al Rawahi, Regional Manager, Development Bank

Early STEM Engagement
Engineering UK's research shows just how powerful early STEM activities can be in shaping perceptions and career aspirations. Their long-term study found students who took part in ongoing STEM enrichment activities were 3.5 times more likely to study STEM subjects after age 16 and 2.9 times more likely to consider careers in engineering or manufacturing. The STEM Learning Network's ENTHUSE Partnership program proved that schools with structured industry partnerships saw a 42% jump in STEM subject uptake and a 68% improvement in student engagement. By giving students hands-on experiences, showing how STEM concepts apply in the real world and connecting them with relatable role models we can spark curiosity and get students excited about manufacturing and engineering careers.

42%
Of schools with structured industry partnerships saw a 42% jump in STEM subject uptake
The STEM Learning Network's ENTHUSE Partnership

Ideas Worth Exploring

1 Create films showcasing modern Omani manufacturing in all its diversity and dynamism - featuring relatable engineers and technicians who share their personal journeys and inspire students to consider these careers. Research by the National STEM Learning Centre shows that films featuring diverse role models boost STEM career consideration by 43% among underrepresented groups.

2 Use social media to craft short, impactful content that grabs student attention and challenges old-school views of manufacturing. The US Manufacturing Institute's "Creators Wanted" TikTok campaign racked up 11.8 million views and increased manufacturing career interest by 27% among Gen Z viewers. The "Creators Wanted Tour" – making 20 stops and travelling 40,000+ kilometers across the US - made a real impact:

Perception Shift:
Research by the Manufacturing Institute and Deloitte revealed a rise in parental approval of manufacturing careers, growing from 27% to 40%.

Community Engagement:
The campaign achieved over 1.5 million email sign-ups from students and career counsellors.

Active Participation:
13,000+students and 3,800 career counsellors participated in the initiative.

Career Outlook Improvement:
84% of participants reported more favourable views of manufacturing careers following their involvement.

Opportunity Expansion:
CreatorsWanted.org now lists 400,000+ job and training opportunities.

Media Impact:
The campaign generated US$5.6 million in positive earned media, reflecting its widespread recognition and approval.

3 Run webinars and workshops for parents and community members introducing them to today's manufacturing career opportunities, providing them with resources to support their children's STEM education. The Baker Dearing Educational Trust's parent engagement program saw a 57% increase in parent support for technical education paths after parents attended industry-led info sessions.

57%
Increase in parent support for technical education after parents attended industry-led info sessions
The Baker Dearing Educational Trust's parent engagement

4 Look beyond rigid subject requirements and recognize skills and potential instead, creating more inclusive pathways into manufacturing careers for students from all backgrounds. The Institute for Apprenticeships and Technical Education reports that skills-based entry requirements boost diversity in technical roles by up to 35%.

University Industry Partnerships

Dr. Mohamed Al Mughairi, Petroleum Engineering Commercialization Manager, PDO

Universities play an important role in developing advanced skills, driving innovation and feeding Omani industry with skilled talent. Yet challenges remain in keeping curricula in sync with industry needs, giving students practical experience and fostering genuine collaboration.

Challenges

Curriculum-Industry Mismatch

Too many students graduate lacking confidence in their ability to use industry-specific technologies and tools revealing a gap between what universities teach and what Oman's manufacturing sector actually needs. The 2023 CBI/Pearson Education & Skills Survey found 71% of employers believe university curricula aren't keeping up with technological changes with particularly large gaps in digital skills, data analytics and sustainable manufacturing practices.

71%

Of employers believe university curricula aren't keeping up with technological changes

The 2023 CBI/Pearson Education & Skills Survey

Limited Practical Experience

Students want more internship opportunities, yet many universities don't make these experiences mandatory. This limits student chances to apply their knowledge in real world settings and develop professional skills. According to the UK's Universities and Colleges Admissions Service just 24% of UK engineering degree programs include mandatory work placements, despite evidence that graduates with substantial work experience are 70% more likely to land relevant jobs within six months of graduation.

Live Local & Prosper

The migration of graduates from manufacturing hubs like Duqm to major cities such as Muscat creates a brain drain, depriving Oman's regional economies of essential skills and expertise. A comprehensive UK study by the Centre for Cities reveals that over 52% ofgraduates from universities in manufacturing regions relocate to London or other major cities within three years of completing their education, representing a serious talent leak for regional industries. To address this trend, the report recommends several strategies. These include developing home-grown talent, strengthening connections between local employers, universities and graduates, focusing on innovation and enterprise policies that appeal to graduates and enhancing transport and housing to improve the city-region's overall economic and lifestyle attractivness.

Case Studies

Autodesk's Future of British Manufacturing Initiative

This brings students, universities and businesses together to boost competitive advantage by breaking down barriers to productivity and innovation. The Fast Track Program, a key element of the initiative, places student experts from top UK design and engineering universities as 'digital catalysts' in established businesses to speed up the adoption of digital technologies. Since launching in 2018, the program has placed over 350 students in 180 manufacturing businesses, driving an average productivity jump of 34% and a 28% increase in digital technology adoption among participating companies.

350

Students placed in 180 manufacturing businesses

Autodesk's Future of British Manufacturing Initiative

The High Value Manufacturing Catapult

This network of research and innovation centres connects universities with manufacturing businesses across the UK. Their Industrial Doctorate program - which embeds PhD researchers in industry settings while maintaining university affiliations - has graduated over 240 industrial researchers since 2015 with 83% remaining in the manufacturing sector. The program has generated 176 patents and contributed to an estimated US$1.5 billion in economic value through innovation and productivity improvements.

Ideas Worth Exploring

- Weave more hands-on industry training and skills development into the university curriculum - giving students a chance to work with industry-standard equipment and software. The World Economic Forum's 2023 Skills Taxonomy: Adoption Toolkit identifies 15 key technical skill clusters for future manufacturing roles, with simulation software, collaborative robotics and data analytics topping the priority list.

- Make sure students get a rich mix of experiences both in and out of the lecture theatre, including internships, research projects and industry-sponsored competitions. UK universities with structured industry experience programs see graduate employment rates 32% higher than the national average for engineering and manufacturing.

- Build closer links with businesses to keep curriculum relevant and bring industry professionals into classrooms as guest lecturers and mentors. The Sheffield Advanced Manufacturing Research Centre's Industrial Advisory Board model has slashed curriculum update cycles from 5 years to 18 months, ensuring greater alignment with industry needs.

- Let's not just focus on technical skills – communication, teamwork and problem-solving are equally as essential for success in today's manufacturing workforce. According to the Manufacturing Institute employers rank problem-solving, teamwork and communication as the top three skills needed for advanced manufacturing roles, alongside technical competencies.

- Set up innovation hubs and maker spaces where students, faculty and industry partners can collaborate. The MIT-Fab Foundation study found that universities with open innovation spaces generate 3.7 times more industry partnerships and 2.4 times more commercialized research outputs than those without such facilities.

Universities with open innovation spaces generate 3.7 times more industry partnerships

HE Azzan Al Busaidi
Undersecretary, Tourism
Ministry of Heritage & Tourism

From Classroom to Coast

In this Duqm Now interview HE Azzan Al Busaidi, Undersecretary, Tourism, Ministry of Heritage & Tourism shares his insights on the role of education-industry collaboration in shaping the future of Oman's tourism sector. Drawing on the latest trends and developments, he discusses how partnerships between academic institutions and the tourism industry are driving innovation, building a skilled workforce and ensuring Oman remains at the forefront of global tourism growth.

How important are links between education and Oman's tourism industry?

The connection between education and tourism isn't just important – it's essential, especially here in Oman where we're seeing unprecedented growth in the sector. Tourism is constantly evolving – new technologies emerge, traveller preferences shift and global trends reshape the landscape almost overnight. In this dynamic environment, strong partnerships between schools, universities and the tourism industry aren't just beneficial – they're the foundation of our future success.

When schools and universities collaborate with industry partners, everyone benefits. Students gain practical, relevant skills and valuable internship opportunities. Meanwhile, hotels, tour operators, airlines and resorts receive graduates who can hit the ground running. Without these partnerships, we risk creating a skills gap where students learn theory that may be outdated by graduation day.

The stakes are high when considering tourism's economic impact. Pre-pandemic, the industry accounted for 10.4% of global GDP and 10% of all jobs worldwide. The recovery has been remarkable – especially here in Oman, where we welcomed a record-breaking 4 million visitors in 2023, representing a 37.9% increase on 2022. This momentum drives our ambitious target of over 11 million international arrivals annually by 2040. With these figures, tourism clearly isn't just a supplementary economic activity – it's become a fundamental pillar of Oman's economic future.

11 million visitors
Our ambitious target arrivals annually to Oman by 2040

Clearly, an industry of this size and importance demands a highly trained workforce. When schools and universities collaborate with tourism businesses on curriculum development, guest lectures, internship programs and research initiatives, we create a talent pipeline that drives innovation and quality service. For Oman's tourism sector to continue growing sustainably, these partnerships aren't just beneficial – they're a must.

Tourism is evolving quickly. What key trends should our educational programs focus on to prepare students for real-world success?

In my view, there are three major shifts happening in tourism that education programs should address. First, the digital revolution is reshaping everything about how people travel. Recent research shows 72% of travellers now prefer booking online - and it's easy to see why - 53% love the speed, 47% appreciate being able to do price comparisons and 42% find better deals this way. The numbers are staggering - mobile travel booking alone was worth US$228 billion in 2024 and is projected to more than double to US$526 billion by 2032. This isn't just about teaching students to use technology it's about developing digital fluency across everything from social media marketing to using data analytics to personalize guest experiences.

72%

Of travellers now prefer booking online

Second, sustainability has moved from a nice addition to an absolute necessity. Today's travellers are increasingly conscious of their environmental impact and are seeking out businesses that align with their values.

Finally, we're seeing a major shift toward authentic, personalized experiences. Travellers don't just want a place to stay - they want meaningful connections with local culture and people. A multi-generational travel study from Expedia shows 65% of travellers value experiences over material possessions when traveling. While conversations around food sustainability are up 65% across reviews and forums as people seek out ethically sourced dining options on their travels. Attractions like farms and farmers' markets are growing 1,400% faster than the broader food and drink experience category, as travellers take more interest in where their food comes from and how it's made.

These trends require tourism professionals who understand experiential design, storytelling and cultural interpretation. Our students should be equipped to create immersive experiences that honour local traditions while meeting visitor search for authenticity. Those who understand how to leverage technology, implement sustainable practices and create genuine, memorable experiences will be the industry leaders of tomorrow.

How important is digital literacy for today's tourism workforce?

It's critical. In fact, I'd go as far as saying digital literacy isn't even optional anymore in tourism today – it's simply non-negotiable.

Just look at how dramatically our industry has transformed in recent years. Take AI, for example. It's completely revolutionizing how hotels approach marketing. Now they can create highly personalized campaigns that speak directly to individual guest preferences. All those tedious, time-consuming tasks like data analysis and customer segmentation - AI handles them automatically, freeing up marketing teams to focus on the creative, strategic work that humans do best.

But here's the thing - digital literacy goes way beyond just knowing how to use the latest tools. What our staff really need is what I like to call digital critical thinking.

They need to know how to interpret what guests are saying in online reviews, how to respond thoughtfully when someone posts a complaint on social media and how to keep sensitive guest information secure in an age of data breaches.

And honestly, we're just seeing the tip of the iceberg. As technologies like virtual reality and AR become mainstream for creating immersive travel experiences, our entire workforce will need to adapt again. I'm convinced the businesses that will thrive in Oman's tourism sector - whether they're tour operators, hotels, airlines or museums - will be those investing seriously in digitally savvy staff. These teams will work more efficiently, create more memorable experiences for our visitors and be ready to pivot quickly when the next technological wave hits - and trust me, it definitely will.

I'm convinced the businesses that will thrive in Oman's tourism sector will be those investing seriously in digitally savvy staff

A recent report highlighted the importance of emotional and social skills. How can tourism programs better develop these "soft skills"?

You know, we often focus on technical training but soft skills are crucial in tourism – they're at the heart of memorable hospitality experiences. Tourism is first and foremost a service industry, fundamentally about human connection, so we should create learning environments where students can practice adaptability, cultural sensitivity and emotional resilience. These aren't just nice-to-haves – they're essential skills that often determine whether a visitor returns or recommends Oman to others.

Interestingly, The World Economic Forum found that emotional intelligence, empathy and cross-cultural communication are among the most sought-after qualities for tourism employers. So how do we develop these abilities in our students? Locally-based tourism programs have a unique opportunity to innovate in this area. Experiential learning is key - internships where students engage directly with international visitors provide invaluable real-world experience. Role-playing exercises and other hands-on activities are particularly effective in preparing students to handle challenging situations, such as resolving guest complaints or navigating cultural differences.

With the global educational tourism market valued at US$459 billion in 2024 and projected to grow at a CAGR of 13.5% from 2025 to 2030, there's a clear demand for programs that emphasize these practical skills and cross-cultural competencies. This approach not only boosts student confidence but also aligns perfectly with industry trends that prioritize customer experience and adaptability in an increasingly globalized tourism sector.

Tourism jobs can often be seen as low-prestige with little career potential.How can we change this perception and make young people see hospitality as a respected and rewarding career?

This is a great question. I think we need to completely reimagine how we talk about tourism careers. This isn't just about temporary jobs – it's about building professionals who drive our economy. Globally, countries like Switzerland, Germany and Singapore have transformed hospitality into prestigious careers through specialized education and clear advancement paths.

The ministry is taking practical steps to change this perception. First, we're showcasing success stories of Omanis who started at entry-level and now manage large hotels or run successful tourism businesses. Second, we're partnering with colleges and hospitality brands to create management training programs specifically for Omani graduates.

Tourism professionals in advanced markets earn highly competitive salaries – hotel general managers, for example, often earn more than many traditional professional roles. Plus, tourism is projected to create over 100 million new jobs globally by 2034 with management positions growing fastest. Most importantly, we want young Omanis to understand that hospitality skills are transferable across industries and borders. When you develop excellence in customer service, leadership and operational management in tourism, you're building a skillset that's valued worldwide. This isn't just a job – it's a gateway to a global career.

100mn

New tourism jobs projected to be created by 2034

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SPECIAL ECONOMIC ZONE
SULTANATE OF OMAN سلطنة عُمان

Organized by the Special Economic Zone at Duqm (SEZAD) Duqm Now is more than just a quarterly event – it is a unique platform for knowledge exchange, partnership building and sustainable business development. The four 2025 sessions will address key opportunities within the renewable energy sector, the evolving relationship between education and industry, adoption of circular economy practices and the transition to sustainable petrochemical production.

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