RC IX.

Strategic planning for attracting young people to radiation protection and medical physics university programmes

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In this short refresher course, participants will learn how to apply the Strengths-Weaknesses-Opportunities-Threats (SWOT) strategic planning approach to the development and marketing of university courses in radiation protection and medical physics among young people. It is no use having the best planned programmes in the world if there are no students! What type of programmes would be attractive? How to market the programmes? The author will present a case study of how he went about such an exercise for his highly successful BSc Physics, Medical Physics and Radiation Protection.

IRPA2022 Refresher Course IX

Strategic planning for attracting young people to radiation protection and medical physics university programmes

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Soooo……

- You have decided to set up a university programme in MP and RP.
- You look up some programmes on the internet, design a similar programme, put it on the university website and keep your fingers crossed that you will have a sufficient number of students to run the course, right?
- No - just doesn't work in 2022!
- If we want our programme to be successful, we need a new way of thinking. We need strategic thinking!

Learning Outcomes

In this short refresher course, participants will learn how to:

1. Adopt a systematic, STRATEGIC PLANNING attitude to set up a successful MP and RP programme at university
2. Recognize the importance of a VISION statement for driving programme development forward
3. Apply the Strengths-Weaknesses-Opportunities-Threats (SWOT) approach to identify the issues that need to be addressed to make the programme a success
4. Identify features that make a programme in Medical Physics and Radiation Protection attractive to young people of 2022
5. Ascertain the best way of publicising the programme – it's no use having the best programme in the world if prospective students don't know about it!

Lecture Outline

- Strategic planning principles
- Case study at University of Malta: How I applied strategic planning to create a highly successful Medical Physics and Radiation Protection programme.
- Discussion: case studies from course participants – prepare pen and paper to put down any issues that might come to your head regarding your particular situation. We will discuss them at the end.

Strategic Planning

- Step 1: Define your future VISION: define your desired future programme and let it be your guide.
- Step 2: SWOT analysis: what are the issues that you need to consider to help you achieve that vision?
- Step 3: Set up a strategic action plan to achieve the vision

Vision

- The vision is the desired future state of the programme e.g., By 20xx I will have a comprehensive, high level, attractive, future-oriented programme with a sufficient number of motivated students.
- Questions to consider:
  - Separate or combined MP/RP programme? If combined, RP in medicine only also or also include environmental/industrial/energy RP and to what extent do I include these other areas of RP?
  - What is a sufficient number of students for you? What is the minimum number required by your university to run the course? What is the number desired by the human resources department of the Ministry of Health (assuming they have an idea which is rarely the case)?
  - By when do you want to achieve this vision?

Making a programme attractive for Gen Z students?

- Multi-disciplinary
- Maximises job opportunities
- Increases opportunities for travel
- Increases opportunities for further studies
- Not super excessive workload
- Has a strong practical component

SWOT

- Identify the Strengths that you/your dept/subject area have that will help you achieve that vision
- Identify any Weaknesses that you/your dept/subject area have that will hinder you from achieving that vision
- Identify any outside Opportunities that exist that you can use to help you achieve your vision
- Identify any outside Threats that would obstruct you from achieving that vision

Strengths

- Medical Physics and Radiation Protection are very interesting areas of applied Physics.
  - Question: Do your prospective students know about MP and RP and how interesting they are? Very importantly: do their teachers know?!!! Their teachers are your marketing agents. If there are problems, how to tackle them?
- Directive 2013/59/Euratom mandates the appointment of MPEs and RPEs. This means good job opportunities.
  - Do your prospective students and their teachers know that Medical Physicists and Radiation Protection Experts are required by legislation? If not how to tackle this?

Weaknesses

- MP and RP are highly specialised areas and therefore there is a risk that the number of applicants will not be sufficient for the university to run the programme. This is particularly relevant in small countries. Is this your case? If yes, how to tackle it?
- The human resources of MP/RP departments are often too small to produce a comprehensive, high level, interesting, forward-looking programme. How to solve this?
- There is an impression out there that Physics courses are too theoretical and therefore there is a risk that prospective students would think that your programme will be so too. Do you have this problem in your country? If yes, how to tackle it?

Opportunities

- Do you know other European/IAEA etc sources of funds (e.g., Erasmus+, ENEN+) that you can use to make your course appealing to students and provide them with travel opportunities?
- Do you know that since MPE and RPE are legal requirements your Ministry of Health and your department can apply for European Social Fund grants to develop your education and training programmes?
- European projects for MPE (European Guidelines on the MPE) and RPE (ENETRAP) insist on good grounding in physics

Threats

- MP/RP programmes are sometimes seen as a threat by mainstream Physics departments as they are afraid that we take some of their already low number of students. How to tackle this?
- 2 year Masters out of the question as students don't want to lose 2 years of salary any more. However, in a 1 year Masters there is not enough time for a comprehensive high level programme, particularly at a time when the knowledge, skills and competences required to practice MP and RP are increasing as the number and sophistication of medical devices increases daily.
- For a comprehensive, high level, interesting MP/RP programme you need to include also anatomy/physiology/pathology and hospital practicals; yet pre-University Physics/Maths students do not have Biology. How will you address their concerns?

My Solution

- I opted for:
  - A ***BSc Physics, Medical Physics and Radiation Protection*** programme that provides an interesting mix of physics, medical physics, radiation protection, anatomy/physiology/pathology, physics and clinical medical physics practicals *in a single Bachelor programme, followed by a* ***single year Masters programme for Medical Physics and Radiation Protection in clinical medicine***.
- Essential characteristics of the Bachelor programme are:
  - The physics/mathematics/statistics component is sufficiently strong to ensure a strong scientific foundation. *Programme has enough physics in it that they can choose to continue with physics if they wish to do so.*
  - The radiation-protection/medical-physics component has all specialties of MP and RP and is sufficiently comprehensive to permit the reduction of the Masters in Medical Physics from two years to one
  - Includes anatomy/physiology/pathology and hospital practicals to generate interest.
- Essential characteristic of the Masters programme are:
  - All specialties of medical physics with their associated RP
  - Includes forward looking topics such as artificial intelligence and machine learning

Structure of the BSc Physics, Medical Physics and radiation Protection

Year	Physics Mathematics Statistics	Anatomy Physiology Pathology	Medical Physics Radiation Protection	Hospital Clinical Practice	Research, Ethics Legislation, Professional Issues
Year 4	**		*****	*	***
Year 3	***	*	****	*	*
Year 2	****	**	**	*	*
Year 1	****	****	*	Total 336 hours	*

Programme overview:
https://www.um.edu.mt/courses/overview/UBSCHPMRFT-2020-1-O

Full curriculum with study unit learning outcomes:
https://www.um.edu.mt/courses/programme/UBSCHPMRFT-2020-1-O

L-Università ta' Malta
EUROPEAN SOCIAL FUND MALTA 2007-2013
MPE MEDICAL PHYSICS EXPERT
MEDRAPET Medical Radiation Protection Education and Training
EUTEMPE-RX
SEVENTH FRAMEWORK PROGRAMME
IPEM IOP ebooks
EFOMP

Summer School

- Summer school: since our students don't have pre-university biology, we provide a relaxed online school in human biology in the summer before the start of the programme – and the physics/mathematics students simply love it!
- Allay their fears – it's not all of biology, just human biology
- In practice they find it much easier than the physics

The programme has been a great success!

- We are pleased to report that this innovative curricular experiment has been a great success.
- Most attractive features of the programme:
  - The combination of pure and applied physics,
  - The inter-faculty nature of the programme where students share lectures with both physics and students of the healthcare professions
  - The physics practicals and hospital based clinical practicals
  - The students have a wide range of opportunities for employment and further studies
- The programme has provided a welcome boost for both the radiation-protection/medical-physics professions and indeed even physics itself.

Marketing your programme

- *Go to the students, go to the schools*
- Convince the pre-university physics teachers, they are your ambassadors
- Don’t rely on the general university marketing department, develop your own marketing strategy
- YOU AS A PERSON are the greatest asset to the programme - students will come to YOU, if they see that you have a positive, forward-looking personality and caring leadership style. If need be transform yourself.

Thank you for your attention!

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