

Recruitment of students

NBI teachers workshop

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Strategy: Why – goal – how

More students

The right students

Keeping the students

Recently NBI has made a recruitment strategy (NBINet -> Outreach ->...): Why

- From society – Physicists
 - are a highly valued resource across a multitude of industries/professions/fields
 - contribute to important tasks in the society
 - have a very low unemployment rate
 - Are the perfect “generalists”
- “More please!”
(And can the cost be as low as possible...? Private comment!)
- From NBI
 - Students contribute to our work/research efforts!
 - From colleagues at *pure* research labs: “ Gosh I miss to have students to work/test/elaborate on new ideas/directions ...”
 - Granted: they do also require our work
 - “Darwin’s law” in physics: Extremely high competition is desired for few faculty positions – “to get the best of the best of” – a high in take is preferable
 - Last – but not least – economics – “from our institute leader”
 - More funding without overhead → deficit
 - Moving to NBB → deficit
 - Microsoft “goes 100% applied” → deficit
 - Building rental costs → unknown → deficit
 - Student income (“STÅ”) is “guaranteed” – also in case of an increase!!!! (at least for now)

Strategy: The statistics (Thanks to Christine!)

- Why study physics?

Hvad havde størst betydning for dit valg af uddannelse?	BSc Fysik 2019	BSc Fysik 2020	Ønsket udvikling, forslag?
Min interesse for faget	91%	94%	
Det faglige indhold på uddannelsen	60%	60%	
Muligheden for at læse en bestemt specialisering	38%	21%	Mere? - Biofysik – klima – kvanteteknologi
Uddannelsens faglige niveau	35%	26%	
Muligheden for at gøre en forskel med min uddannelse, når jeg er færdig	18%	36%	Mere? – bæredygtighed, sundhed, teknologi
Det sociale liv på uddannelsen	18%	13%	
Den lave arbejdsløshed	16%	8%	
De gode karrieremuligheder, når jeg er færdiguddannet	13%	36%	Mere
De høje lønninger indenfor faget	0%	2%	

- Key points
 - Strong motivation --> astro- and quantum-physics – less on “specialisations” in general
 - To make a difference (society/...)
 - Excellent career-opportunities

Strategy: The statistics (Thanks to Christine!)

- Who applies?

	2014	2015	2016	2017	2018	2019
I alt	143	159	153	158	134	118
Køn						
Mænd	106	113	116	113	100	88
Kvinder	37 (26%)	46 (29%)	37 (24%)	45 (28%)	34 (25%)	30 (25%)
Alder						
<20 år	47	40	41	54	39	35
20 år	33	46	36	31	33	34
21 år	22	21	28	22	26	20
22 år	20	14	10	14	8	10
Snit						
<6	21	27	16	26	5	6
6-8	25	37	44	37	30	21
8-10	44	35	54	50	43	44
10-12	49	53	35	36	52	43
Eksamen						
STX	101	107	94	95	87	72
HTX	24	27	31	32	32	29 (25%)
HF+HHX	10	11	19	19	8	9
Frafald						
	42%	40%	34%	39%	19%	-

Strategy: The statistics (Thanks to Christine!)

How many students pass first year courses (%pass)

Only 1. year students. All first year exams incl. reexams as registered per Aug/Sept.

%pass (no)***	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20
No Optagne**	138 (111)	150 (125)	142 (117)	159 (130)	152 (130)	158 (126)	133 (111)	117 (107)
Mek1	68 (100)	68 (109)	73 (110)	58 (108)	75 (109)	72 (115)	80 (105)	85 (99)
Mek2	73 (94)	63 (104)	65 (99)	59 (104)	55 (96)	51 (86)		
MatIntro	66 (95)	78 (118)	72 (106)	65 (113)	80 (114)	78 (113)	81 (108)	86 (102)
LinAlg	74 (95)	81 (111) [No Title]	77 (107)	67 (107)	81 (109)	76 (105)	87 (108)	89 (102)
TermoProjekt	94 (98)	88 (115)	82 (110)	73 (113)	79 (106)	73 (94)	82 (100)	80 (94)
MatF	64 (84)	76 (103)	62 (94)	56 (98)	66 (99)	62 (90)	77 (83)	80 (78)
MatF2*	66 (33)*	68 (26)*	72 (42)*	60 (98)	77 (97)	68 (83)	79 (77)	75 (70)
EM1	56 (67)	58 (73)	64 (76)	53 (88)	61 (76)	56 (71)	64 (70)	77 (81)
Average of %	70	72	71	61	71	67	79	82

1st year 2020/21 numbers look promising!

%Pass	50-60%	60-70%	70-80%	80-100%
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*MatF2 was an elective course until 2015/2016.

**This line shows: Number enrolled (number enrolled aug/sept the following year after removing dropouts)

***The table shows: %pass (number of students passed)

Strategy: Goals

- 150 admitted students. (20-30 increase → ~10+ Mkr income)
 - Objective: 2STX / 1HTX fraction. (1 st October admission numbers)
 - Grade level and admission requirements: we await the ministry → **NEWS**
 - Better gender balance. Objective: 33% women
 - Increased focus on potential dropouts through early follow-up and alignment of expectations
- **More students and make sure they finish (lost time for students?), loss of revenue for NBI and wasted money from society)**

Strategy: Tools

- Broaden/diversify our definition of the potential student
 - Career path
 - Profile
 - Motivation

→ If our prime goal – and definition of “interesting” student – is to educate all students to get a job as future physics researchers – WE FAIL at the ~99% level!
- Increase focus on technical high schools (HTX)
 - Dedicated experiments / student visits /...
 - Strong focus on natural science, math, experiment and lab → but are typically “guided” to DTU
 - Matches the requirements of NBI
- Interact with teachers – “one happy teacher sends (many?) students for years”
 - Inspiration
 - Collaboration (project/experiments)
 - Training
- Improve communication
 - “be visible everywhere and as much as possible with the right message”

Strategy: Tools (huge credit to NBI communication and Christine!)

- Activities (not complete...!)
 - Open days
 - Internship
 - High school visits
 - Projects (SRP/SOP), Ulab,...
 - Inspirational day for teachers
- Webpages (moving target these days)
 - The right information – at the right time – at the right place
 - One page cannot do it all!
 - **SocialMedia** --> movies, stories, news,....
- Improved course curriculum
 - “Semester courses” on 1st year – similar on 2nd.
 - More “freedom” and better time for project
 - Increased focus on programming / data
- New
 - Core narratives
 - Focus on HTX – lab, tech, visits ...

NBI's three NEW core narratives

	Narrative 1: An elite education	Narrative 2: Focus on skills	Narrative 3: “Save the world”
Education	High vocational level; demanding lectures	Strong analytical and digital competences; projector, laboratory	Application of physics to understand complicated correlations; projects/group work
Study environment	Discussion of universe’s big questions with peers	Collaboration with industry	Multidisciplinary, combination of methods
Career	Research	AI specialist High technology	Biotechnology, climate, materials
Relevance	International distinction	Development of future technologies	Sustainable development; better health

Recent developments

- The ministry of education has just changed the admittance requirements for physics at all Danish universities (2 year test) – but **not DTU**
- The new requirements are
 - "AAB" – Mat A, Fys A (no grade) (2021)
 - "AAB" – Mat A grade 7+, Fys A (no grade) (2022) – **WE CAN CHANGE THIS!**
 - "ABB" – Mat A grade 7+, Fys B grade 7+ (2021)

The good: A significant higher potential of students: +3000 (also VERY good!) (this was the argument from the ministry)

The bad: Much more diverse "portefolio" of students

The ugly: To quote Kim Splittorff (now teaching in high school): "the new category of students have no idea on the difference between speed and velocity" – any reference to a mathematical foundation of physics is lost

Time for the audience to do some work...

Discussions

Breakout rooms

- Get more students
- Get the right students
- Maintain our level in the education **and** reduce dropout

Discussion: How do we get more students

- “Do a better job than Christine and Jorgen”: what should our message / focus / plan of attack be?
- SoMe/Facebook/Instagram/Youtube (“A day in the lab”,...)
- Newspapers...
- IDEAS!!!!!! (or send to Anja, Christine, JBH)

Discussion: How do we get the right students – that will stay and graduate...

- Just motivation?
 - A bunch a “mini-me/you”
 - Skills oriented – career focus
 - Make a difference in society
- Adopt a teaching catalogue to reflect skills / rather than specialisations? To what extend?
- Be more specific in our “requirements” – skills?
- And on what we provide?

Discussion/ideas: With a much more diverse group of students -- What should we do to maintain our level in the education **and** reduce dropout?

- Brush-up?
- Prep-classes?
- Start-up?
- Extra “afternoon” classes?
- Targeted efforts based on student level?
- “group” students based on an initial test?
- Extra curricular activities?

High school teachers – “one happy teacher sends (many?) students for years”!

- Currently NBI has a “inspirational day” with topical lectures for teacher
- SCIENCE is trying (with MATH as test) to create an “afternoon coffee course series”
- High school teachers are desperately looking for material / input / contributions to use in their teaching
- NBI should plan for training / update courses for high school teachers
 - Resources – or paid?
 - Apply for funding?
- Every $\sim 3^{\text{rd}}$ year the high school has a new topical subject
 - Currently it is medical physics (particle therapy and radiation)
 - Next year: Satellites and earth observation
 - NBI could chip in with courses / material / exercises / “experiments”

Discussion → Engaging teachers...

- Suggestions for getting high school teachers to inspire students towards NBI?
- Workshops on teaching material / experiment
- Update courses?
- Training?

We should be careful not to do their job....

Thanks!!!

- Suggestions / ideas etc.

Send to NBI communication / Christine / JB