Physics teacher education program survey

This survey aims to find out how graduated physics and mathematics teachers from University of Eastern Finland between the years 2008-2016 have experienced the education received. The education provided by University of Eastern Finland is evaluated from the perspective of physics teacher studies. In the course of this research, the quality of know-how provided by teacher education for different areas is mapped, as is the significance of these areas for actual teaching profession. All the information provided by the respondents is handled with confidentiality and anonymity, and they are used for research purposes only. The results will be published in *AUTHOR'S NAME*'s master's thesis. Besides this, the results will be utilized as a part of bigger evaluation-based development strategy for teacher education. Whilst responding to the survey, you will be involved in developing subject teacher education furthermore.

NB! This survey solely evaluates the know-how received in teacher education. You should exclude the know-how that has been learned outside from studies or after studies.

If you have any questions, contact: *AUTHOR'S NAME AND EMAIL*

Supervisors helping in implementing this survey:

Associate professor

NAME

Early-stage researcher

NAME

Background information

Name:

The year of graduation:

Major:

The extent of physics studies taken (introductory studies, intermediate studies, advanced studies):

Working experience (in terms of time):

Which school level are you working in? (primary level, lower secondary level, upper secondary level, university of applied sciences/polytechnic, university):

Areas of physics

		How good know-how teacher education gave you for the following areas? 1 = not at all 2 = poor 3 = mediocre 4 = good 5 = excellent					What is the significance of this area for teaching profession? 1 = not significant at all 2 = somewhat significant 3 = significant 4 = very significant 5 = I cannot say				
		1	2	3	4	5	1	2	3	4	5
#1	Mechanics	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#2	Electricity	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#3	Waves/optics	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#4	Radiation	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#5	Electricity and magnetism	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#6	Thermal physics	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#7	Quantum and atom physics	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#8	Different areas of physics in general	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Applying physics and its significance

		How good know-how teacher education gave you for the following areas? 1 = not at all 2 = poor 3 = mediocre 4 = good 5 = excellent					What is the significance of this area for teaching profession? 1 = not significant at all 2 = somewhat significant 3 = significant 4 = very significant 5 = I cannot say				
		1	2	3	4	5	1	2	3	4	5
#9	About the different applications of different areas of physics	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#10	Energy production	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#11	Physics related to everyday life	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#12	The societal significance of electricity	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#13	The societal significance of physics in general	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

General know-how of physics

		How good know-how teacher education gave you for the following areas? 1 = not at all 2 = poor 3 = mediocre 4 = good 5 = excellent					What is the significance of this area for teaching profession? 1 = not significant at all 2 = somewhat significant 3 = significant 4 = very significant 5 = I cannot say				
		1	2	3	4	5	1	2	3	4	5
#14	Physics concepts and using them	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#15	Formal notations of physics	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#16	Models and modeling nature of physics	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#17	Different representations of physics	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#18	Accuracy in measurements in physics	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#19	The history of physics	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Structural knowledge of physics

		How good know-how teacher education gave you for the following areas? 1 = not at all 2 = poor 3 = mediocre 4 = good 5 = excellent					What is the significance of this area for teaching profession? 1 = not significant at all 2 = somewhat significant 3 = significant 4 = very significant 5 = I cannot say				
		1	2	3	4	5	1	2	3	4	5
#20	About the dual nature of physics (the interaction between phenomena observed and forming theory whilst concepts, laws, and theories are constructed)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#21	The hierarchical conceptual system of physics (grasping a new concept requires understanding previous concepts)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#22	About the connection between concepts and quantities (new concepts and quantities are constructed based on previously known connections for quantities)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#23	The significance widens and deepens whilst moving from one school level to another	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#24	How physics knowledge (phenomena, concepts, quantities, laws, theories) is constructed in general	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Planning teaching

		How good know-how teacher education gave you for the following areas? 1 = not at all 2 = poor 3 = mediocre 4 = good 5 = excellent					What is the significance of this area for teaching profession? 1 = not significant at all 2 = somewhat significant 3 = significant 4 = very significant 5 = I cannot say				
		1	2	3	4	5	1	2	3	4	5
#25	Planning individual lessons	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#26	Planning whole courses	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#27	Setting learning aims	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#28	Formulating and choosing physics tasks	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#29	Acknowledging pupils' preliminary knowledge in planning teachings	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Teaching methods and executing teaching

		How good know-how teacher education gave you for the following areas? 1 = not at all 2 = poor 3 = mediocre 4 = good 5 = excellent					What is the significance of this area for teaching profession? 1 = not significant at all 2 = somewhat significant 3 = significant 4 = very significant 5 = I cannot say				
		1	2	3	4	5	1	2	3	4	5
#30	Teachings methods	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#31	Applying teaching methods in practice	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#32	Different roles of a teacher, e.g. working as a supervisor/director	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#33	Differentiating pupils of a different level	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#34	Working in a classroom	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#35	Controlling the class in general	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Motivating pupils

		How good know-how teacher education gave you for the following areas? 1 = not at all 2 = poor 3 = mediocre 4 = good 5 = excellent					What is the significance of this area for teaching profession? 1 = not significant at all 2 = somewhat significant 3 = significant 4 = very significant 5 = I cannot say				
		1	2	3	4	5	1	2	3	4	5
#36	Awakening pupil's interest and motivation at the beginning of a new theme	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#37	Enhancing pupil's interest towards physics and studying it	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#38	Maintaining pupil's motivation for studying physics	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#39	Supporting pupil's self-esteem in studying the subject	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#40	Creating experiences about succeeding	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Learning and the related challenges

		How good know-how teacher education gave you for the following areas? 1 = not at all 2 = poor 3 = mediocre 4 = good 5 = excellent					What is the significance of this area for teaching profession? 1 = not significant at all 2 = somewhat significant 3 = significant 4 = very significant 5 = I cannot say				
		1	2	3	4	5	1	2	3	4	5
#41	Learning theories	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#42	Learning environments	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#43	Ways of learning	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#44	Misconceptions of physics and pupils' pre-knowledge	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#45	The diagnosed factors affecting learning	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#46	The development of pupil's thinking skills	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#47	The development of pupil's physics content knowledge	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Evaluating learning and measuring it

		How good know-how teacher education gave you for the following areas? 1 = not at all 2 = poor 3 = mediocre 4 = good 5 = excellent					What is the significance of this area for teaching profession? 1 = not significant at all 2 = somewhat significant 3 = significant 4 = very significant 5 = I cannot say				
		1	2	3	4	5	1	2	3	4	5
#48	Planning exam answers	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#49	Evaluating exam answers	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#50	Rating pupils' answers	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#51	Identifying false answers	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#52	Evaluating pupils' ICT skills	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#53	Evaluating pupils' thinking related to physics	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#54	Evaluating pupils' know-how in general	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#55	Utilising versatile evaluation methods	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#56	Supporting learning with the aid of evaluation	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Utilising material and technology in teaching

		How good know-how teacher education gave you for the following areas? 1 = not at all 2 = poor 3 = mediocre 4 = good 5 = excellent					What is the significance of this area for teaching profession? 1 = not significant at all 2 = somewhat significant 3 = significant 4 = very significant 5 = I cannot say				
		1	2	3	4	5	1	2	3	4	5
#57	Knowing the differences between different textbooks	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#58	Choosing an appropriate textbook for one's own teaching	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#59	Using teaching material (e.g. textbooks, other material)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#60	Using educational equipment (e.g. document cameras, data projectors)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#61	Using educational technology (e.g. computers, smartboards)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#62	Using software in teaching (e.g. Logger Pro)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Curriculum/standards

		How good know-how teacher education gave you for the following areas? 1 = not at all 2 = poor 3 = mediocre 4 = good 5 = excellent					What is the significance of this area for teaching profession? 1 = not significant at all 2 = somewhat significant 3 = significant 4 = very significant 5 = I cannot say				
		1	2	3	4	5	1	2	3	4	5
#63	About the content of physics teaching from the national curriculum	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#64	About the physics aims from the national curriculum	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#65	General aims of teaching from the national curriculum	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#66	Schools' own curricula	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Safety

		How good know-how teacher education gave you for the following areas? 1 = not at all 2 = poor 3 = mediocre 4 = good 5 = excellent					What is the significance of this area for teaching profession? 1 = not significant at all 2 = somewhat significant 3 = significant 4 = very significant 5 = I cannot say				
		1	2	3	4	5	1	2	3	4	5
#67	Electrical safety	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#68	Radiation safety	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
#69	General safety in experimental working	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐