



Centre for Innovation
and Technology Transfer
Management

WARSAW UNIVERSITY OF TECHNOLOGY

THE IMPACT OF FAMILY BACKGROUND ON THE EDUCATIONAL CHOICES (UNTIL ENTRY INTO HIGHER EDUCATION) AND SUCCESS OF WUT GRADUATES



WUT

The impact of family background on the educational choices (until entry into higher education) and success of WUT graduates

REPORT

as part of the study entitled

Success Stories. Warsaw University of Technology graduates (a diagnosis of professional success factors)

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TABLE OF CONTENTS

	Introduction	4
1	Study background	5
2	Methodology	5
3	Study results	9
	Previous studies on identifying the role of the family	9
	Family of origin	10
	Parents' education and occupational status	10
	Family members' influence on making education-related decisions	11
	Family members' role in making education-related decisions	14
	Education	16
	WUT graduate's profile as a student	16
	Family members' influence on WUT graduate's development in childhood	18
	Influence of the school environment (teachers, other students) on the WUT graduate's development	19
	Childhood dream job and the current occupational situation of the WUT graduate	20
4	Conclusions	23

1. STUDY BACKGROUND

This is part of a series of studies to investigate the needs and expectations of WUT graduates' employers, conducted since 2016 by the Research and Analysis Department of the Centre for Innovation and Technology Transfer Management at the Warsaw University of Technology (DBA CZLiTT PW). By diagnosing the professional status of WUT graduates on the labour market and identifying the circumstances that helped to achieve this status, valuable insights into the quality of education at WUT were gained. The conclusions drawn from the study have illuminated certain aspects that are useful for managing the quality of education at WUT. Research of graduates' careers forms part of the efforts by tertiary institutions to perform the broadest-possible evaluation of educational outcomes and to examine how these outcomes contribute to graduates' future careers.

2. METHODOLOGY

This study aimed to diagnose the factors behind WUT graduates' professional success. The aim was translated into six research questions (two of which are analysed in this report):

- » How do WUT graduates define "success"?
- » What are the unique academic/scientific, commercial and social achievements of WUT graduates?
- » What did the career paths of WUT graduates look like (milestones, motivations)?
- » **What were the internal factors behind WUT graduates' success?**
- » **What were the external factors behind WUT graduates' success?**
- » What role did WUT play in graduates' success?

The aim of the analysis presented in the report was to diagnose the impact of family background on WUT graduates' success in the context of their educational choices.

An additional objective of the study was to promote the Warsaw University of Technology by creating content on WUT graduates' success stories to be published on WUT's website.

The study was based on individual in-depth interviews (IDI) with successful WUT graduates, i.e. alumni with an outstanding track-record of academic or scientific achievements, professional successes, community involvement, or work in high-profile organisations. The question of whether or not a graduate became successful was ultimately left to the subjective opinion of that graduate. Individual in-depth interviews involve direct interaction between researchers and respondents. It is based on a scenario comprising a set of subjects to be addressed to gain insights into the experiences, interpretations of events and in-depth opinions of the respondents¹.

The following thematic areas were discussed in the interviews:

- » success: definition, types of success, respondents' achievements;
- » professional career: what the career looks like, milestones, current position, barriers and difficulties encountered during the career;
- » education: what did education outside tertiary institutions look like, which study programme was chosen and how it was completed, the best memories from WUT, an assessment of WUT's educational services and overall activities, respondents' assessment of whether they would choose the same educational pathway, educational activities after graduating;
- » external (family, environment) and internal factors (personality traits);
- » advice for WUT students and candidates;
- » four sentences to be completed – career path summary.

A variety of channels were used to recruit respondents:

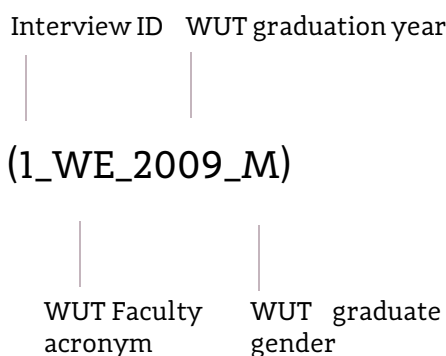
- » recommendations from the management and staff of individual WUT Faculties;
- » recommendations from WUT graduates (respondents);

¹ Cf. Babbie, E., *The Basics of Social Research*, Fourth Edition, Thomson Wadsworth 2008, p. 335-337.

- » own search using LinkedIn, <https://www.eksperci.pw.edu.pl/> and other pw.edu.pl domain websites and websites of high-profile companies in individual industries specific to the profiles of WUT Faculties;
- » announcements on social media (Facebook, LinkedIn) with information about the study and a link to the registration form;
- » posters displayed within WUT's spaces.

The interviews were recorded², and reflections were formulated as preliminary reports in which their authors provided tentative interpretations of the responses. Some of the interviews were also fully transcribed. Due to their structured format, the preliminary reports were the first tool to analyse individual stories. They also helped to create “personas” – graphics depicting graduates’ careers and opinions, available on pw.edu.pl domain websites.

Explanation of cited sources:



For the purposes of this report, a detailed analysis was performed of the parts of the study that explored the respondents’ accumulated educational capital (educational background prior to entering higher education, the approach to choosing schools, commitment and engagement at school, extracurricular activities, first memories of learning, family of origin features, parental education and occupation, siblings’ activities, other persons’ influence on the respondent’s choices, “significant others”, the process of choosing the university and study programme), childhood dream jobs and the current occupational situation (to verify if the childhood dream had been fulfilled).

In order to segregate and structure the research material, thematic areas and detailed themes were created under which to qualify the responses.

Thematic areas and detailed themes:

- » education and occupational status of parents:
 - parents’ educational attainment,
 - parents’ occupation,
 - business, if any, conducted by family members,
 - financial situation of the family,
 - size of the place of origin;
- » family members’ influence on the WUT graduate’s development:
 - value placed by the family on education,
 - values instilled in the WUT graduate by his or her family,
 - conditions for development created by the family;
- » family members’ role in making educational decisions:
 - the manner of making decisions on pre-tertiary education,
 - factors behind the choice of pre-tertiary schools,
 - approach to making decisions on higher education,
 - factors behind the choice of the university and study programme;

² All the interviews were recorded following respondents’ full consent.

TOMASZ DETKA



- **scientific clubs**
activity in student organizations
- **Students' Council**
activity in the organization that associates scientific clubs; becoming a member of the internal training team at WUT
- **CZLiTT PW**
taking part in research projects
- **Łukasiewicz - PIMOT**
co-creating the Electromobility Department
- **GRADUATE**
Faculty of Electrical Engineering (2018)
field of study: automation and robotics
- **CHIEF**
of Department of Electromobility at Łukasiewicz Research Network - The Automotive Industry Institute (PIMOT); team management, scientific work, commercial activity

GREATEST ACCOMPLISHMENT

- construction of a good team at Łukasiewicz Research Network - The Automotive Industry Institute (PIMOT)

ADVICE FOR STUDENTS

- "Be honest with yourself. If you notice that what you are doing is not fun for you, have the courage to change it."
- "Look for nonmandatory forms of student activity such as scientific clubs or students' council."
- "Don't give up your own development for the sake of working full-time on developing someone else's business."

THOUGHTS ON THE CAREER

"I am at this point of my career because..."

of many coincidences (whom I have helped many times); mainly because of my openness and honesty towards myself."

"What I appreciate most about my careers..."

are the people I could learn from and the people I work with now."



"Success is when you are satisfied with yourself; if you are surrounded by people whom you can trust and who have trust in you. It is when you find an emotional balance in life - then you have all you need."

MEMORIES FROM WUT

"Activity in a science club. It helped me grow. It gave me the opportunity to experience many aspects of the university that I would not experience as a regular student, for example I got to work in a team, which had its specific goals."

TIME AT WUT - KEY ASSETS

- soft skills acquired as part of the activity in a scientific club

- » WUT graduate's profile as a student:
 - degrees,
 - engagement in extracurricular educational activities,
 - engagement in other extracurricular activities,
- » impact of the quality of education provided by the WUT graduate's schools on his or her development:
 - type of secondary school finished by the WUT graduate,
 - assessment of the quality of teaching at the given school,
- » influence of the school environment (teachers, other students) on the WUT graduate's development:
 - teacher influence,
 - peer influence,
 - influence by other individuals in the school environment
- » childhood dream job and the current occupational situation of the WUT graduate:
 - childhood dream job,
 - WUT graduate's current occupation,
 - fulfilment of the job-related childhood dream.

his Report is divided into sub-chapters by thematic area. Note that not all WUT graduates discussed topics that were compatible with these thematic areas.



3. STUDY RESULTS

3.1 PREVIOUS STUDIES ON IDENTIFYING THE ROLE OF THE FAMILY

The family plays a fundamental role in fulfilling and developing such needs as the need for safety, new experiences, recognition, and love. It moulds the attributes and dispositions of the child that critically inform his or her future life. Children inherit certain biological features from their parents, but they are also prone to what is known as social inheritance. The family in which a child is born has a certain degree of influence on his or her chances of meeting future life goals³.

According to a study based on the results of US research into parental influence on the educational and occupational aspirations of children, analyses of this subject focus on the developmental period up to secondary school graduation, and the factors that play a developmental role in this period include the parents' occupations, the family's socio-economic status, the parents' commitment to the parenting process, as well as peers and teachers⁴.

In 2012 the Educational Research Institute (Instytut Badań Edukacyjnych – IBE) ran pilot studies involving parents of primary school third-graders. Their aim was to answer questions about the occupational aspirations of parents⁵ in regard to their children and the degree to which these aspirations varied by place of residence, parents' educational attainment and gender of the child, and also about the persons that exert significant influence on children (a sample of 566 parents). The summary of this project's results indicated that most parents wanted their children to "follow medical occupations, professions requiring high qualifications (e.g. economists, lawyers), as well as technology-related and teaching occupations." The child's gender was the strongest differentiating factor for parental preferences. Girls were traditionally expected to pursue careers in medical and teaching occupations, while technology-related professions were preferred for boys. Preferences also varied by parents' education and place of residence (and there was a significant correlation between these variables). Individuals with an academic degree who lived in cities were more likely to wish that their children followed occupations requiring high qualifications, and also more inclined to let their children decide about what occupation to pursue. Parents with lower educational attainment who lived in rural areas wanted their children to follow occupations requiring lower qualifications and teaching occupations"⁶.

The study's authors from IBE mentioned D.E. Super's career development theory, which recognises the role of parents in shaping childrens' self-knowledge about their occupational orientation, since parents are a source of information about the possible occupations and the circumstances associated with pursuing them. Other theorist, L.S. Gottfredson, has stressed the significance of the parents' socio-economic status and the child's gender – the possibility of shaping children's aspirations by following a specific occupation (acting as a role model) and of influencing their understanding of gender roles. And according to J.S. Eccles's theory, parents influence their children's motivation to achieve – also in the occupational sphere – by emphasising the attractiveness of the occupations they believe will give their children the highest chance of becoming successful, and by strengthening their self-esteem⁷.

With these considerations in mind, this study – whose aim is to provide the results of an analysis of the impact of family background on Warsaw University of Technology graduates' educational choices and, by extension, their success in future life – focuses on childhood and adolescence periods in respondents' lives (until their entry into higher education), and also on the role played during these periods by members of their families (mainly parents), peers, and teachers.

³ Cf. Czapów, C., *Rodzina a wychowanie*, Instytut Wydawniczy „Nasza Księgarnia”, Warsaw 1968, p. 8-9.

⁴ Garg, Kauppi, Lewko, & Urjnik, 2002; Garg, Melanson, & Levin, 2007; Sánchez, Reyes, & Singh, 2006; Teachman, & Paasch, 1998, [in:] Julie K. Nelson, *Impact of Parent Education on Student Success*, 2009, <https://files.eric.ed.gov/fulltext/ED507263.pdf>. Księgarnia”, Warsaw 1968, p. 8-9.

⁵ Cf. Kozłowski, W., Matczak, E., *Aspiracje zawodowe rodziców w stosunku do własnych dzieci (raport z badań pilotażowych)*, Instytut Badań Edukacyjnych, Warsaw 2012, p. 7.

⁶ Ibid, p. 3.

⁷ Ibid, p. 6.

3.2. FAMILY OF ORIGIN

3.2.1 PARENTS' EDUCATION AND OCCUPATIONAL STATUS

The majority of the respondents had at least one parent who completed secondary or higher education. Some of the parents had technical education (vocational, secondary, or higher).

For some parents of WUT graduates, the pathway to a certain educational attainment could have been extended in time due to the financial status of their family, or the period in which they grew up (World War II, the Polish People's Republic). Generation could be a factor as well when it comes to the value being placed by parents on their children having higher education. Below are some responses that support this claim:

It think that the reason for our generation's drive towards getting higher education was that some of our parents had no opportunity to earn a degree, and they believed that obtaining one was a good place to start.

8_WCh_2013_F

My mum got a degree at a time when it was rare for people to have higher education. She was a philologist by education, although in secondary school she took part in a mathematical olympiad. (..) My father did not go to university after graduating from secondary technical school because his family was very poor. In fact, by the time he did go to university, he was long grown-up and had kids.

4_WF_2012_M

Thus from the responses by WUT graduates the conclusion can be drawn that parents believed it was important for their children to have higher education, regardless of their own educational attainment. The main reason was that they cared about their children and wanted to provide them with the best possible opportunities to succeed in life, which they thought was attainable through higher education (easier to find a job, better pay, more financial security, higher social status, more opportunities to explore the world).

I think the reason was also that people with a degree were believed to have much better chances to land a good job, or any job for that matter. With a degree, they would always have some skills that would help them find a job faster than without higher education.

83_WE_2011_M

It should be stressed, however, that parents did not pressure their children into entering a path towards higher education.

If I want [to go to university], that's good. But it's ok, too, if I decide to become a hairdresser.

27_WMEiL_2015_F

It definitely wasn't like we had to be better educated than our parents. If we weren't up to it, they would be equally glad to show us another way. My dad had secondary technical education, so we knew that you don't have to be a professor to do what you like to do, be good at it, and make a good living from it.

9_WE_2018_M

Parents' influence on WUT graduates' decision to pursue a pathway towards higher education could be indirect in that the respondents grew up among educated people and could watch their behaviours, values, and status, and were given positive feedback about their abilities and talents.

The way parents function has a major impact on children, including on their educational decisions.

83_WE_2011_M

I think that the fact that my parents and all my grandparents had higher education was also a significant factor.

83_WE_2011_M

Your grandfather was a mechanical engineer, your mum is a chemist, you have educated parents, come from an educated family – of course you're going to be good at maths. I had this conviction that I was actually good at it.

16_WEiTL_2016_F

In families that placed value on higher education, WUT graduates were taught that it was important to learn. And they were provided with good conditions to learn, which made them eager to do so.

They would always tell me that if you own something, some property or wealth, you can always lose it to some misfortune. What you put in your head, however, will stay there forever.

35_WIM_2012_F

Parents who encouraged WUT graduates to continue education after primary/lower secondary school can be divided into two groups:

- » the majority group, who did not pressure their children into choosing their educational pathways and performing well at school;
- » the minority group who expected their children to secure “good occupations”, not necessarily ones that were compatible with their children’s aptitudes.

Respondents’ places of origin varied in size. Several respondents mentioned the development opportunities afforded by growing up in a big city, especially Warsaw (access to activities and places that promoted personal growth, easier to establish contacts) – those WUT graduates came from smaller localities.

In big cities it's certainly easier, where you have access to all the infrastructure, the variety of educational and cultural establishments. What can help us in establishing contacts and acquiring knowledge is definitely our everyday environment, including the place in which we live.

96_WGiK_2016_M

Case study – no higher education traditions in the family, parents place value on higher education:

The respondent did not come from an affluent family. Her family also had no traditions related to higher education – the father finished vocational school and the mother did not continue her education past secondary school finals. They would tell her daughter that only by getting higher education could she make a decent life – something they were unable to give her. As she recalled: *“If you want to stop worrying over what you’re going to eat a week before it’s pay day, like we do, start learning. You need to start learning if you want to have a better life.”* (92 WICHiP_1997_F)

3.2.2 FAMILY MEMBERS’ INFLUENCE ON THE WUT GRADUATE’S DEVELOPMENT IN CHILDHOOD

Parents had a positive influence on WUT graduates by encouraging them to learn, stimulating their comprehensive intellectual development, fostering their curiosity about the world, supporting their aptitudes, recognising their educational successes, and creating an atmosphere of closeness and order. Parents supported their children by (among others):

- » allowing them to ask questions/engage in discussions;
- » affording trust (but verifying) and autonomy;
- » being understanding;
- » helping to do the homework and learn school material, especially at early educational stages;
- » providing them with opportunities to take part in extracurricular activities, including competitions, subject-related olympiads, science picnics, etc. (devoting their time, funds);
- » providing them access to books and journals;

- » doing DIY together;
- » sharing their own passions (e.g. teaching their children how to play chess);
- » allowing their children to visit them at their workplace (fostering their interest in a specific field);
- » taking them to interesting places (e.g. museums);
- » enabling them to attend a school in an area or region away from home (commuting, boarding school, flat leasing).

I remember that I rented a lot of books from the library. (...) I remember there was a popular science section with books on various subjects, such as science and technology, space, dinosaurs.

27_WMEiL_2015_F

It should be stressed that despite their willingness to foster their children's interests, some parents could not afford to do so (fees, learning tools, such as computer).

W ramach swoich możliwości starali się dawać mi zawsze najlepsze narzędzia.

38_WMEiL_2019_M

Parents instilled in their children – future WUT graduates – a learning habit and taught them discipline, and also explained to them why they believed education and expanding knowledge was important. In times of doubt the motivation provided by parents proved to be very important.

I had a fairly independent mindset. Their role was very important when I was starting my education. First, second, third grade – because I have never liked to learn. Learning was something I was trying to avoid, and they simply watched over me. And my parents taught me some discipline.

18_WMiNI_1998_M

When in lower secondary school, I sometimes lost my motivation, but they helped me get it back and supported me. They had never questioned any of my educational and, later, career choices.

11_WM_2013_M

According to WUT graduates it was very important for parents to be attentive to what their children were interested in and what gave them satisfaction so that they could see their potential and nurture their passions. When the child is in doubt, the parents' role is to provide advice instead of imposing solutions. Children's development choices should be accepted when financially feasible, as this teaches them independence and promotes confidence in their own abilities.

At some points in life it is parents who suggest these extracurricular activities. And that was the case with me.

9_WE_2018_M

My parents were committed and helpful, but not intrusive.

23_WA_2014_F

My parents made sure to show us new interests and helped us explore them. If we – me and my sister – showed some talent for visual arts, they would suggest that we take up extracurricular visual arts classes. A community arts centre, something like that. So, we had had some earlier experiences with visual arts, broadly speaking.

44_WA_2007_M

I am grateful to my parents for not giving me ready-made solutions. I got the fishing rod, not the fish. And this has paid off in my adult life – I don't like to be given ready-made solutions. I prefer to work them out on my own.

61_WAiNS_2016_M

In some rare cases, the family's impact on the child's interests could have been negative, e.g. in that children were forced to attend extracurricular activities, exercise playing an instrument at home because of family traditions despite their reluctance to do so (although in hindsight they appreciated having the skills thus acquired), etc., and urged to choose a specific school (causing their dissatisfaction and guiding them in a different direction at later stages of their education).

MONIKA KRASIŃSKA

GRADUATE

Faculty of Materials Science and Engineering
field of study: materials engineering
(2012)



involvement in the Students Union

acquiring the ability to work in a group, cooperate and manage various projects

working at Danfoss Poland

(2010)

continuing studies

at Faculty of Power and Aeronautical Engineering WUT

MANAGEMENT BOARD REPRESENTATIVE

Green Investment

GI City Therm

GI Hrubieszów

DIRECTOR OF THE LEGAL AND ANALYTICAL DEPARTMENT

Energy Solution



"Success is the satisfaction with who you are and what you do. And when at the same time you can afford to make your dreams come true, do you need anything more?."

MEMORIES FROM WUT

"My best memories are related to the activity in the Students Union. In addition to acquiring new skills, I've gained there stories full of unforgettable people and various projects."

TIME AT WUT - KEY ASSETS

- casual reasoning
- to search for information and draw conclusions quickly

GREATEST ACCOMPLISHMENTS

- privately: „I am a happy person!”
- professionally: independence at work, respect of professional community and the trust of superiors

ADVICE FOR STUDENTS

- "Don't be afraid to take on different kinds of challenges."
- "Use 100% of your study time so that you won't regret later that you did not take a chance - or did not do something."

THOUGHTS ON THE CAREER

"I am at this point of my career because..."

of my work, the skills developed over the years and a bit of luck."

"What I appreciate most about my career..."

is the fact that I've met wonderful people, the independence of my position and the satisfaction coming from what I do."

Case study – parents as the first teachers that inspire their children to be curious about the world:

The respondent claimed that acceptance was the strongest support parents could give to their children. They gave him advice when he asked for it, but in no way did they impose their solutions or decisions on him. His first memory of learning is associated with his parents: I remember a book series called “Świat dziś i jutro” (“The world of today and tomorrow”). Today, I read these books with my kid. My parents, who were also curious about the world, would take us to interesting places. I remember reading a book to my dad and him saying that this was interesting because he didn’t know that. And that was great (4_WF_2012_M). Parents encouraged the respondent to learn, but they also showed him, through their attitude, that learning was fun and that the world was an interesting place.

3.2.3 FAMILY MEMBERS’ ROLE IN MAKING EDUCATION-RELATED DECISIONS

When choosing the primary school for their children, parents usually picked those that were closest to their homes, and children had no influence on their decisions in that regard. When choosing lower secondary school, the quality of teaching was additionally taken into account, and the choice was consulted with the child. The choice of upper secondary school was more thought-through, and decisions were made together, or independently by the respondents (factors considered included school ranking and prestige, available class profiles, opinions from other students, choices made by friends).

WUT graduates’ parents can be divided into two groups in terms of making educational decisions:

- » those who did not force their opinions on their children and instead motivated them to continue learning and supported their choices (the majority),
- » those who directly made the decisions (the minority; family traditions, location, wanting their children to “learn a trade”).

My parents had never told me where to go. I was entirely free to decide.

38_WMEiL_2019_M

When allowed by parents to choose their school, some WUT graduates picked fields of education that were directly or indirectly related to their parents’ occupation or education (parental authority, picking up interests from parents).

In some cases parents suggested the future WUT graduates what would be the best secondary school for them, and encouraged them to go to a technical university instead of a non-technical one. However, it was not insistence but suggestion on their part.

It was definitely my idea, even though it might have been brought up by my family sometime somewhere. I may have not realised it, but it’s possible.

9_WE_2018_M

My mum told me that if I wanted to be a writer I could become one even after graduating secondary school with a focus on maths and physics but it would be difficult to go the other way round.

27_WMEiL_2015_F

WUT graduates’ choices were rarely rejected, and if they were, it was due to the parents’ belief that their children had greater potential and that they would earn better prospects by attending a different school that was not their original choice.

Those WUT graduates who chose their educational paths independently named the following as some of the factors that influenced them: hobbies, being interested in specific school subjects and getting good grades in these subjects, teacher feedback, feedback from and choices made by friends (e.g. wanting to continue education at lower secondary school with students from the primary school class), school rankings, availability of the desirable teaching profiles. In rare instances the choice of educational paths by WUT graduates was influenced by their parents owning a business (which, among others, made them interested in a specific industry, and allowed them to gain their first professional experiences).

Back then I chose the best high school in the city from the ranking, because it was difficult to get there. I got in. I chose the math-physics class because I wanted to.

34_WMEiL_2012_M

The choice of the university and study programme was mostly an independent decision made by WUT graduates. Factors that guided their choice included their interests, the subjects in which they had passed entry exams, the subjects they had to pass at secondary school finals to be able to be accepted into a specific programme, the university's prestige, their opinion about the university after a university open day, the syllabus, feedback from older students, feedback from WUT graduates, the university's place in rankings, as well as a cold calculation of their labour market prospects after graduating from different programmes (if they had diverse academic interests).

Only a handful of respondents stated explicitly that they chose to pursue a specific study programme because of their family's traditions. Other respondents who said that their choices were consistent with family tradition claimed that they made their decisions independently.

I'm the third generation in my family that works in the telecommunications industry. My grandpa and grandma started the tradition, and both my parents are engineers and work in this industry. And I'm the third generation. My brother also works in the telecommunications industry, and he, too, graduated from the Warsaw University of Technology. But we didn't make these choices because that was family tradition.

31_WIP_2007_M

Going to so-called workshops at technical secondary school with my dad, playing there with oscilloscopes, was a big part of my life when I was a kid. (...) There was something about it that fascinated me (...) so I chose the WUT and study programme due to my IT-related interests.

53_WEiTI_2008_F

Parents were usually content with WUT graduates' choices (they were understood and viewed as the right choices that did not require intervention), apart from the rare instances in which they were surprised by the educational path their children chose to follow (e.g. physics and chemistry instead of medicine, electrical engineering instead of pharmaceuticals). Several respondents said that their parents discouraged them from something (e.g. medicine, despite family traditions, geodesy, archaeology).

I think it was my dad's idea, but he didn't tell me this back then. But he probably had this idea of me going to the WUT. (...) When I was in secondary school, he put some pressure on me to go to the WUT. I didn't really care, though.

25_WMEiL_2018_M

Notably, some respondents claimed that parents should suggest their children what study programmes to choose, since they are more experienced and knowledgeable, and because the decision about higher education is taken at too early an age.

I think they have a very important role to play. Owing to their life and professional experience, parents know the current job market expectations, and so they should not so much tell as suggest their children what educational path to take. Of course, it shouldn't be forced. Otherwise the effect would be the opposite of what was intended. But parents should, to some degree, suggest the direction in which their children should go.

83_WE_2011_M

Siblings were rarely mentioned as a topic, and if they were, it was in the context of choosing similar development paths (respondents asked their older siblings what they thought about their university/study programme choices) or making entirely different choices (siblings with education in medical or humanistic fields). Some WUT graduates claimed that parents placed more pressure on older and only children when it comes to choosing their educational paths.

Theoretically, it was my choice. In reality, though, I went a path paved by my siblings. I took the easy way out.

94_WGiK_2007_M

Case study – the positive role of siblings:

The respondent received his first information about studying at the WUT from his brother, who graduated from the same WUT Faculty. (38_WMEiL_2019_M)

Case study – the positive role of parent and siblings:

When choosing his studies, the respondent was considering two faculties: the Faculty of Civil Engineering (WUT) and the Faculty of Electrical Engineering (WUT). His twin brother decided to choose the civil engineering. His choice was based on the fact that three industries are present at the construction site: construction, sanitation and electricity. The respondent's father (construction) worked in one of these industries, thanks to which he knew its specifics. His father convinced him to choose the electrical engineering. The brother chose the construction industry. (93_WE_2018_M)

3.3. EDUCATION

3.3.1 WUT GRADUATE'S PROFILE AS A STUDENT

The majority of the WUT graduates covered by the study showed at least good performance at primary and secondary school. A small number of WUT graduates said that they were average students and that they disregarded subjects that were of no interest to them. Only a couple of respondents mentioned any issues with their conduct at school.

I was your average B and C student. If I got an A, it was by accident. I liked to go to school. In lower secondary school I got a diploma for the highest school attendance of all students.

58_WiL_2018_M

Few WUT graduates mentioned the need to be the best, to win in competitions, and to receive end-of-year certificates with honours. Good school performance and school achievements were usually of secondary importance to what they really wanted to do – developing their interests.

The grades of WUT graduates resulted from their abilities, efforts, as well as the fact that they enjoyed acquiring knowledge and did not consider learning to be a bothersome obligation. They liked school and learning.

I was always a B or A student, and I liked to learn, but I didn't have to spend a lot of time learning, since it came easily to me. Especially in primary school. I always engaged in quite a lot of afterschool activities (such as sailing), but I managed to keep it together with school without problems.

23_WA_2014_F

I really liked school. I still love September. I have always felt positive energy filling me during this month. (...) For me, each year could always start from September and not from January.

33_WA_?_F

I never had trouble learning. It was not so much hard work as curiosity for me

21_WEiTI_2005_M

For some of the average students, the lower grades were due to their lack of commitment to the subjects they were not interested in, or due to the increased amount of time they had to spend learning them.

It's because I knuckled down and mastered the material. I remember getting an A on this one test. So, it makes you kind of proud that you can do this if you want – sometimes you just need to devote more time than others to make it there. But once you've mastered it, there are no more barriers.

35_WiM_2012_F

Some did not like memorisation-based subjects (history, some aspects of biology, geography), instead preferring those that were essentially about understanding concepts, phenomena, and interrelations.

Generally, I had a keen interest in what was taught during class. All things chemical, biological, mathematical. I just wanted to [know] how it all worked, and why it worked that way, and why it was called like that. I found it interesting.

15_WT_2012_F

School has always been a place where you can acquire basic knowledge (...). I loved some subjects, and some I hated, and I didn't exactly excel in some fields. But I think it's natural.

68_WCh_2011_F

Interestingly, some WUT graduates were not necessarily passionate about the exact sciences at school – some of them felt more attracted to Polish, history, visual arts, citizenship education, and geography. A couple of respondents even remarked about being lazy, saying that they were thankful to people around them who helped them work on self-discipline.

It was just very immature, you just didn't think about it seriously, I didn't study at all (...). But I'm very glad because this taught me something. It taught me work.

22_WF_2008_M

One respondent observed that school does not support students' strengths and interests (noting, however, that a possible change towards such support should not be at the expense of other subjects).

I have always wondered why parents or teachers told you to take extra classes to catch up in subjects in which you performed poorly instead of doing the opposite – getting the student signed up for extracurricular activities in subjects in which they were successful and which interested them to foster their passion and help it grow.

60_WIBHiiŚ_2015_F

The WUT graduates covered by the study were distinctively active at various levels of their education when it came to extracurricular activities at school, cultural community centres, and other establishments, provided that they had such opportunities (this depended on what the school had to offer, the size of the place of residence, whether their parents could afford it). The extracurricular activities included:

subject-related clubs, elective courses	competitions, subject-related olympiads (including in humanities)	student government	educational trips (e.g. a secondary-school trip to the nuclear research reactor in Świerk)	sporting activities (swimming, team sports, dancing classes)
music classes	courses (painting, drawing, dancing, computer programming, gliding, photography, sailing)	foreign languages	handicrafts	scouting and excursions

As far as activities in science clubs at school are concerned, I'd say that if there was something available, I'd get involved. Quite frankly, though, I feel huge resentment to the places I learned at for not providing such activities. Compared to people in Warsaw, for instance, I was much worse off when it comes to developing my interests and abilities.

14_WMEiL_2014_M

WUT graduates had a highly diverse range of interests – from the exact sciences, to the humanities, to sports: mathematics, physics, astronomy, literature, history, music (playing instruments, choir singing), painting, strategy games, puzzle solving, sailing, volleyball.

Several respondents mentioned the value of sporting activities, which taught self-discipline, organisation, and mental resilience (results extended in time, having to undergo evaluation, dealing with criticism, failures).

Case study – those who succeeded did not necessarily excel at pre-tertiary levels:

The respondent admitted that at primary school he was a “terrible student”. However, at the age of 16-17, when he was in technical secondary school, there was a sudden change – “even the teachers had a hard time believing it, because in an instant I started having better notes without any effort.” (10_WM_2003_M).

3.3.2 THE IMPACT OF THE QUALITY OF EDUCATION PROVIDED BY THE WUT GRADUATE’S SCHOOLS ON THEIR DEVELOPMENT

Most WUT graduates covered by the study attended general secondary schools (classes with a focus on mathematics and physics, mathematics and IT, biology and chemistry, etc.).

Some WUT graduates noticed differences in students’ knowledge and quality of work in the initial years, associated with the different types and quality of schools they came from. Nevertheless, they claimed that these differences became less pronounced over the months and years at the WUT.

The majority of WUT graduates said that their former schools provided good-quality education (in based on the long-standing esteem enjoyed by their educational establishments; more recently – based on rankings). It should be noted, however, that some respondents thought this was not a prerequisite to success, although it could help.

The general secondary school was unexceptional, they had a rather crude approach to teaching, but there you have it – one of the students became a senator, and lots of them came to be professors. One fellow student, only a year junior to me, was the Head of the Government Centre for Strategic Studies. So, people made [careers] in different areas. But this, as we thought, unremarkable little school of ours, has actually produced quite a lot successful alumni.

3_WF_1978_M

One WUT graduate purposefully chose a secondary school that did not fare well in rankings, because he believed that those which performed better focused on the rankings instead of providing solid education. Another respondent mentioned his dissatisfaction – in hindsight – with the insufficiently demanding teachers at his school.

It should be noted that even if a student performed well at lower secondary or secondary school, regardless of its teaching quality, there was no guarantee that the student would not struggle at later educational stages. Characteristically, if they did struggle later on, they had the motivation not to give up their school/university nor class profile/study programme. Rather, they worked to catch up – on their own, or with the assistance of parents, fellow students, tutors.

During my initial years at the WUT, it was all tears and sweat for me as I struggled to make up for the shortcomings from secondary school. However, it taught and mobilised me to work hard. I wanted to catch up by working hard.

64_WF_1997_M

Those WUT graduates who had no problems transitioning from secondary school to university in terms of the material to be learned could become involved in extracurricular activities such as student government and science clubs.

Several WUT graduates provided some interesting reasons for why it is worth thinking twice when choosing between general secondary school and technical secondary school if the long-term plan involves studying at a technical university. Technical secondary schools give students a strong practical and laboratory background, but provide them with insufficient theoretical preparation (mathematics, physics, chemistry). Conversely, general secondary schools provide students with a strong theoretical preparation but little to no practical background. Moreover, general secondary schools in a way “force” their graduates to enter higher education, since the education they provide is too general to meet the labour market requirements.

My technical secondary school background actually made it a bit easier for me to handle technical subjects at the university. I had a solid grounding in subjects such as electrical engineering and electronics. I had it all figured out, so it was easier.

69_WT_2011_M

Compared to fellow students who graduated from general secondary schools, coming from a technical school, I had a vast learning gap to bridge. Enormous gap. (...) Back then, compared to me – a technical school graduate – people from general schools had a much superior set of skills and habits when it came to consolidating knowledge.

32_WBMiP_1987_M

Coming out of general secondary school, you have no actual occupation, so either way you have to get higher education. And if you can't handle a technical university, you enter a more humanities-oriented programme.

12_WCh_2012_F

Case study – difference between the student's existing track record and his or her performance at a higher-level school with more stringent requirements:

One WUT graduate said he was one of the best students at primary and lower secondary school – he had no trouble getting A grades. After entering general secondary school, his performance was not as good as before despite him putting in similar effort: *You go to a general secondary school that is superior to your previous schools and become an average, if not the weakest, student in your class. At general secondary school, I was even on the brink of failing one humanities subject, but eventually I made it through.* (73_WE_2016_M).

3.3.3 Influence of the school environment (teachers, other students) on the WUT graduate's development

During the interviews WUT graduates also mentioned that their development and educational decisions were influenced by teachers, peers, and older students.

The first group includes not only teachers of the exact sciences (mathematics, physics, chemistry), but also homeroom, natural science, history, and Polish teachers. They created a good climate for learning, taught students logical thinking, and how to comprehend and analyse facts. And they also instilled passions in students, made them curious about the world, and helped them realise it was important to have a “refuge” from work. These educators played an important role as advisers and mentors, helping the future WUT graduates to discover their potential, believing in their capabilities, and encouraging them to participate in competitions, olympiads, and to continue their education, or to choose better schools and universities. At the same time, they were demanding teachers who knew how to teach discipline.

[The teacher] insisted strongly that I should go to a general secondary school. He probably saw more [potential] in me than I did as a kid.

32_WBMiP_1987_M

If it wasn't for my primary school maths teacher, I wouldn't be sitting here. I'm one thousand percent sure of that. And it's only because the key-word for his lessons was discipline. In each class every single one of us had to answer questions about the material covered during the previous lesson.

24_WF_2010_M

It is worth emphasising that in hindsight WUT graduates appreciated demanding teachers and realised that it was thanks to their disciplined approach that they were better prepared for subsequent educational stages.

University lecturers had a much more liberal approach than my teachers at the general secondary school, so I felt very comfortable.

18_WMiNI_1998_M

WUT graduates' development was also influenced by peers in that they learned together and motivated each other.

We had a great group of friends there – supporting each other and learning together. We were all up a creek without a paddle, but we had the determination to get past these challenges.

4_WF_2012_M

I always liked to learn and go to school. And I was lucky enough to be in a group of peers who shared the same goals and values.

33_WA_?_F

Older students shared information that were useful in making decisions on future educational stages.

It is worth noting here that a couple of respondents mentioned having issues with their peer groups. Some WUT graduates experienced inappropriate behaviour from other students because their superior school performance made them stand out.

Case study – the positive role of teachers:

One respondent recalled that as a student he was very committed to studying his main field – geodesy – and teachers supported him and gave him considerable freedom in other subjects. He earned scholarships awarded by the Prime Minister. Teachers believed that he would use the scholarships to purchase expensive specialist books that would help him with his future education. He is a two-time Geodesy Olympiad laureate, and the freedom he was given to learn his favourite subject was one of the reasons he could achieve this. By learning on his own in preparation for olympiads, he could break out of the school-education pattern, as well as break free from the mindset that the level of his knowledge depended on the teacher – he realised that he could learn on his own and make independent choices to expand his knowledge in areas that were of interest to him. (37_WGiK_2018_M).

3.4. Childhood dream job and the current occupational situation of the WUT graduate

A minority of WUT graduates had no childhood dream jobs, or did not remember them, or had some occupation-related dreams that were general in nature (such as DIY, drawing, travelling, leaving their home town and becoming successful, being interested in technology, design, construction).

I don't remember having any specific dream. My childhood revolved around all things technical. I remember putting together some radios, and once I built a pistol. I even have a photo of me fiddling with a gear. (...) Technology has always been my thing. I consider it an extension of my childhood interests.

108_WSiMR_1976_M

Other respondents' dreams can be divided into two groups: those that were related to technology/broadly defined science and those that were not.

1. Related to technology/broadly defined science (in no particular order):

archeologist	railway industry	space industry (constructing a satellite, a rocket, being an astronaut)	chemist
electronics engineer	geographer	engineer	IT (computer science, computer programming, including computer game development)
physician	mechanic	scientist/researcher/discover/inventor (including owning a laboratory, developing something that will help humanity, earning the Nobel Prize)	
paleontologist	pilot (including liners, military jets)	technician (including working at a large manufacturing plant)	university lecturer

2. Unrelated to technology/broadly defined science (in no particular order):

actor	bank manager	journalist	shop assistant
hairdresser	lorry driver	accountant	flower vendor
painter	musical	teacher	excavator operator
football player	singer	policeman	sportsman
carpenter	firefighter	septic tank servicer	garbage collector
veterinarian	business owner/CEO/ manager		

I got my first doll when I was 14, other than that it was hammers and stuff.

84_WE_1970_F

I always told my grandma that I would become a mechanic.

24_WF_2010_M

Some of the WUT graduates covered by the study managed to make their dreams come true (becoming an engineer, computer programmer, working at a commercial lab, being a scientist/academic, university lecturer). These also included dreams that were general in nature (DIY, interest in technology – engineer; design, construction – designing hydraulic engineering systems; a world-travelling business person – business travels as part of working in a major company ; drawing – architect).

Some respondents followed their dreams indirectly (by working at a company involved with the space industry, working in the pharmaceutical industry, retraining for a different line of work to get closer to fulfilling dreams), including in their free time (piloting small aircraft, astronomy).

A number of WUT graduates covered by the study pursued careers in fields unrelated to their original dreams, but intended to revisit their childhood plans (including related to space, scientific activity).

One respondent admitted openly that having fulfilled his dream at some stage of his career (international business travels), he did not intend to revisit it because it proved unsatisfactory. Another WUT graduate achieved his dream by working in an occupation that was not the one he originally intended to enter (flying – cabin crew).

The dreams had not been fulfilled due to such factors as a change in personal interests, a decision to expand capabilities in other fields, or a reassessment of the situation. One respondent admitted that the choice of career path based on a childhood fascination might not end as we would wish.

Childhood dreams are not always the best choices in life.

52_WA_2014_M

Case study – retraining to enter an occupation related to a childhood passion:

After gaining experience in the IT industry, one WUT graduate decided to realise his dream of becoming a pilot. After obtaining the required licenses, he started working at an airline (21_WEiTI_2005_M).

WŁODZIMIERZ BIELIŃSKI



GRADUATE

Faculty of Mathematics and Information Science
field of study: applied computer science (1998)

job fair organised by BEST

came to the Arthur Andersen company presentation, met the employees, took part in the recruitment, got the job

International MBA at WUT BUbusiness School

working at Arthur Andersen

at the beginning he was implementing the IT systems, then he was promoted to the project manager position

working at Arthur Andersen in the Kiev branch

4 years after graduation, he took up an independent position and was reporting directly to the bank president (2002)

working in a credit company

developed business projects and projects of expansion to the foreign markets (2006)

working at PZU

starting from a team at the director level (2009) to a team of 20 (2016) with PLN 8 million of assets under management

FOUNDING HIS OWN BUSINESS

investment advisory

GREATEST ACCOMPLISHMENTS

- using the knowledge acquired at the University despite the retraining
- developing an investment portfolio worth PLN 8 billion (with the PZU team)

ADVICE FOR STUDENTS

- "Be open to other ways of thinking."
- "It is worth learning math - math intuition will always be useful to you and will be your advantage."

THOUGHTS ON THE CAREER

"I am at this point of my career because..."

of the knowledge and experience I gained earlier."

"What I appreciate most about my career..."

is the opportunity to work with very talented people."



"Success is the ability to make your dreams and expectations come true

and to satisfy your desires.

These desires may be for different aspects of life: a matter of personal and professional life or a matter of social activity."

MEMORIES FROM WUT

"I went to WUT precisely because it was difficult for me to motivate myself to study - at WUT I had to learn how to do it.

I was aware that I needed a whip, an extrinsic source of motivation and WUT provided it to me."

TIME AT WUT - KEY ASSETS

- mathematics
- a structured approach to the problem
- basics of business management

4. CONCLUSIONS

The above analysis leads to the conclusion that family background has a positive impact on WUT graduates' success. The key factor is to create appropriate emotional conditions for the child's development. Frequently featured words in respondents' recollections included "support", "atmosphere", "trust", "autonomy" and "help". Factors such as parents' education and their occupational and social status, and the financial situation of the family were not decisive in respondents' success, although they helped them to become successful by providing positive role models and allowing them to develop their interests in fields that require expenditures (on extracurricular activities, equipment).

In terms of supporting growth that helps to become successful later in life, WUT graduates' families can be described as supportive, motivating, understanding, promoting self-confidence, and providing good role models.

It is evident that the educational paths chosen by WUT graduates led them to achieve success that was in line with their families' expectations or traditions, although there was not necessarily a direct relationship between them. Even when given freedom to make educational choices, the WUT graduates covered by the study indirectly followed paths that were more or less compatible with what their families expected in terms of educational attainment or the field pursued. Cases in which WUT graduates made fully conscious choices against the will of their families (administration studies instead of geodesy, or secondary school instead of vocational school) were rare.

A high quality of pre-tertiary education received by WUT graduates helped them to become successful. This factor was related to, among others, having access to demanding teachers, interest clubs, the opportunity to participate in competitions and olympiads, being better prepared for the initial university years.

Another significant factor in WUT graduates' success in later life involved being exposed to teachers that were supportive and yet demanding. It is important to note, here, however, that this does not necessarily include teachers of the exact sciences, but also homeroom teachers, historians, and Polish teachers.

Among the external factors explored by the study, peers had the smallest impact on success in later life. This group was the least likely to be mentioned, although it proved important at those points/stages at which WUT graduates had no support from teachers (e.g. who focused on student performance figures rather than on helping them to understand a subject) and/or parents (e.g. living away from home when in secondary school).

As an addition to the reports, we included information about organisations bringing together WUT graduates and publications focusing on WUT graduates. The list has been compiled based on online sources. WUT Faculties are welcome to expand this list.

Table 1. List of information about graduates published by WUT Faculties

Faculty	Association/ Organisation	Publications/ Websites
Warsaw University of Technology – general	Association of Warsaw University of Technology Graduates WUT Seniors Club	WUT Golden Book WUT Golden Diplomas online: www.placpolitechniki1.wordpress.com www.wutsquare.wordpress.com
Faculty of Architecture	Academic Association of the Faculty of Architecture at the Warsaw University of Technology	W. Karczmarczyk (2018), <i>Wydział Architektury Politechniki Warszawskiej: wspomnienia, 1950-2015</i> W. Karczmarczyk (2019), <i>A'51: absolwenci WA PW rocznik'51</i>
Faculty of Automotive and Construction Machinery Engineering	WUT Faculty of Automotive and Construction Machinery Engineering Graduates Club	online: www.simr.pw.edu.pl/Strona-glowna-wydzialu-SiMR/Cooperation/graduates
Faculty of Building Services, Hydro and Environmental Engineering	Association of the Graduates of Hydraulic Engineering and Water Management at WUT Association of the Graduates of Sanitary Engineering Graduates Club of the Institute of Environmental Engineering Systems at WUT	A. Kulig, K. Wojdyga (red.) (2016), <i>Od Inżynierii wodnej przez technikę sanitarną do inżynierii środowiska w 100-letniej tradycji Politechniki Warszawskiej</i> M. Degles (1997), <i>Zjazd Absolwentów Instytutu Systemów Inżynierii Środowiska Politechniki Warszawskiej: [13/14.06.1997]</i> Faculty of Environmental Engineering (presently: Faculty of Building Services, Hydro and Environmental Engineering) (2011), <i>60-lecie Wydziału Inżynierii Środowiska Politechniki Warszawskiej. 1915/-2011</i> The „100-tu Absolwentów na 100-lecie Wydziału” (“100 graduates for the 100th Anniversary of the Faculty”) campaign – results published online on the Faculty’s Library FB account online: https://is.pw.edu.pl/absolwent
Faculty of Chemical and Process Engineering	Association of Graduates and friends of Faculty of Chemical and Process Engineering at WUT	
Faculty of Chemistry	”Klatrat” – Association of Students and Graduates of the Faculty of Chemistry at WUT	
Faculty of Civil Engineering		W. Przychoda (2014), <i>Wspomnienia zatrzymane w kadrze: absolwenci Wydziału Inżynierii Lądowej Politechniki Warszawskiej: rok rozpoczęcia studiów 1964</i> G. Jemielita (2005), <i>Jubileusz 90-lecia Wydziału Inżynierii Lądowej Politechniki Warszawskiej</i> G. Borończyk-Płaska, H. Zobel (2015), <i>100-lecie odnowienia tradycji Wydziału Inżynierii Lądowej</i>
Faculty of Civil Engineering, Mechanics and Petrochemistry in Płock		(1997), 30 lat Politechniki Warszawskiej w Płocku: zjazd absolwentów (Płock 04.X.1997 r.) (1987), Absolwenci Ośrodka Naukowo-Dydaktycznego Filii Politechniki Warszawskiej w Płocku A. Kowalski (1977), <i>Absolwenci Filii Politechniki Warszawskiej</i> M. Rutkowska (2012), <i>45 lat Politechniki Warszawskiej w Płocku, spis absolwentów 1971-2011</i> online: www.pw.plock.pl/Absolwenci

Faculty	Association/ Organisation	Publications/ Websites
Faculty of Electrical Engineering	Association of the Graduates of the Faculty of Electrical Engineering at the Warsaw University of Technology	Z. Grunwald (1983), <i>Zarys Historii Wydziału Elektrycznego 1921-1981</i> J. Dąbrowski et al. (2015), <i>Okruchy wspomnień absolwentów Wydziału Elektrycznego Politechniki Warszawskiej rocznik 1953-58</i> online: www.ee.pw.edu.pl/main/strefa-absolwenta/
Faculty of Electronics and Information Technology	Associations of Graduates of Electronics at the Warsaw University of Technology @ELKApw	R. Morawski (2001), <i>Wczoraj, dziś i jutro Wydziału Elektroniki i Technik Informacyjnych Politechniki Warszawskiej</i> J. Modelski, K. Zaremba (2005), <i>Instytut Radioelektroniki - wczoraj, dziś, jutro</i> online: www.elka.pw.edu.pl/Spolecznosc/Absolwenci
Faculty of Management		D. Nizałek (2001), <i>Absolwenci studiów inżyniersko- ekonomicznych, organizacji zarządzania, zarządzania i marketingu od 1955 do 2001 roku</i> D. Nizałek (2003), <i>Absolwenci studiów inżyniersko- ekonomicznych, organizacji zarządzania, zarządzania i marketingu od 2001 do 2003 roku</i> online: www.wz.pw.edu.pl/Kandydat/Opinie-absolwentow
Faculty of Materials Science and Engineering	Association of Materials Engineering Graduates at WUT	Association of Institute of Printing Technology Graduates at WUT (2013) Institute of Typography at WUT 1968-2013 online: www.wim.pw.edu.pl/Absolwenci
Faculty of Mathematics and Information Science		online: ww2.mini.pw.edu.pl/studia/inzynierskie-i-licencjackie/rekrutacja/opinia-absolwentow/
Faculty of Mechatronics		F. Szafranski, D. Holejko (2017), <i>Księga wspomnień 1953-2017. T. 1</i> F. Szafranski, D. Holejko (2018), <i>Księga wspomnień 1953-2018. T. 2</i> S. Hawrat, E. Makowska (1997), <i>Absolwenci: 35-lecie Wydziału Mechatroniki</i> S. Hawrat(1977), <i>Wydział Mechaniki Precyzyjnej 1962-1977: absolwenci 1955-1977</i> I. Trendak, M. Stachura (2016), <i>Zarys historii i osiągnięć Instytutu Automatyki i Robotyki Politechniki Warszawskiej (1957-2015)</i> A. Szwendowski (2012), <i>Od Katedry Optyki do Zakładu Inżynierii Fotonicznej Politechniki Warszawskiej 1953-2008</i> online: www.facebook.com/HenrykTREBERT/
Faculty of Physics		online: https://absolwenci.fizyka.pw.edu.pl/lista
Faculty of Power and Aeronautical Engineering		C. Rzymkowski, K. Kędzior (2015), <i>60-lecie Katedry/Zakładu Teorii Maszyn i Mechanizmów/Robotów (2000), IV Zjazd Wychowanków Wydziału Mechanicznego Energetyki i Lotnictwa Politechniki Warszawskiej z okazji 40-lecia Wydziału MEiL i 175 lat kształcenia technicznego na Politechnice Warszawskiej</i> (2002), <i>V Zjazd Absolwentów Wydziału Mechanicznego Politechniki Warszawskiej immatrykulowanych w latach 1945 i 1946</i>
Faculty of Mechanical and Industrial Engineering	Association of Institute of Printing Technology Graduates	online: www.wip.pw.edu.pl/poligrafia/O-nas/Absolwenci
Faculty of Transport		online: www.wt.pw.edu.pl/Absolwenci

