ESTS Presidential Address

Education motivation . . . inspiration of Generation Y. The evolution of our species†

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The academic environment is intellectually dynamic and is constantly evolving and transforming itself. The profound changes in academic medicine and health-care delivery are due to multiple factors and are making the traditional model of faculty development obsolete. These modifications are mainly related to a decrease in government support and to changes in the sophistication, costs and funding of biomedical research. They are also related to the evolution of reimbursement systems for hospitals and physicians, to a general loss of respect for the medical and scientific professions and to radical changes in the structure of the health-care delivery system. However, these modifications are also linked to the evolution of motivations and values among different generations and their interaction with new technologies. The art of mentorship, which relies upon the mentor-mentee relationship, is clearly affected by these changes. In fact, intergenerational differences may have become so striking that they are causing misunderstanding and incomprenhension. They may also interfere with learning objectives, patient care and administrative management of medical institutions, consequently raising barriers to mentoring [1]. The impact also may be felt in hiring, work habits and financial decisions [2].

Current residency applicants belong to Generation Y and are significantly different from previous trainees and the faculty who supervise them. They live in an era with incredible and exciting opportunities in medicine and research. The analysis of intergenerational differences in the workplace is crucial to improve communication, which should lead to a modification of the mechanisms for resident attraction, recruitment and management, as well as of educational paradigms. Academic leadership should evolve and adapt to the changing world in order to pursue high-quality objectives and keep high educational standards. This should, in turn, contribute to the production of new generations of high-level educators and mentors.

GENERATION OVERVIEW

People born in close temporal proximity have similar values, motivations, beliefs, behaviours and cultural backgrounds, as well as a perceived membership in their age cluster [3]. These similar cohorts are called ‘generations’, each comprising a period of about 20–25 years. This time span was originally chosen because it represented the average age a woman would have children. It is also about the length of one phase of a person’s life: childhood and adolescence, young adulthood, midlife and old age. However, improved technology and a rapidly changing world are causing this time frame to shrink; unique identifiers are now tending to remain stable for shorter periods [4]. Strauss and Howe [5] discovered a pattern in the historical generations they examined, which revolved around generational events, or ‘turnings’, and they identified in a ‘seculum’ a four-stage cycle of social or mood eras that repeat in sequence.

For each generation, historical events and social norms in childhood and adolescence have a crucial impact on priorities, values and career expectations at more mature ages, therefore creating different profiles for each generation and allowing generalization within each cohort. For these reasons, the concept of generation can be used to differentiate and compare age clusters. Historical events shape generations in childhhood and young adulthood; then, as parents and leaders in midlife and old age, generations in turn shape history. Thus, generations are not born; they are made and they make history.

Within the last 100 years, five generational clusters can be identified: Pre-Boomers, Baby Boomers, Generation X, Generation Y and Generation Z.

Pre-Boomers (Silent) Generation (born 1925–44; about 40 million people)

They were given this name because they were known to work hard without complaining. Born in the Great Depression Era, this generation represents a fairly small population, since poverty engendered lower birth rates. The Great Depression, World War II, the Cold War and the atomic bomb represented their main historical landmarks. Their critical cultural events were post-war prosperity, the advent of television and the availability of commercial airline travel. Strange [6] emphasized their loyalty and conformity, nicknaming them the ‘we are generation’.

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**Baby Boomers** (born 1945–64; 79 million people; 55% of all active physicians)

They were named for the post-World War II population boom that occurred in a period of relative prosperity. They were influenced by the culture of the 1960s, the assassinations of John F. Kennedy and Martin Luther King Jr, the Watergate scandal, the Korean and Vietnam Wars and the Cold War. They were the first children to have television. This generation is clearly challenged by technology. They currently occupy positions of authority in the workplace (i.e. president, dean, department chair, full professors or other senior faculty members). The critical cultural events for this generation were rock-and-roll music as highlighted by the Woodstock music festival, the widespread availability of oral contraceptive agents and the introduction of mainframe computers, first in university campuses and then in all other institutions. Nicknamed the ‘me generation’, they celebrate individualism.

**Generation X** (born 1965–80; 61 million people; 30% of all active physicians)

‘X’ stands for ‘generation unknown’. Landmark world events for this generation were Desert Storm, the Islamic Revolution that deposed the Iranian Shah, the fall of the Berlin Wall and the dissolution of the Soviet Union. The critical events impacting this generation were the US energy crisis, the explosion of the Challenger Space Shuttle, the diffusion of AIDS, punk rock and the worldwide introduction of personal computers. They were named the ‘we differ generation’.

**Generation Y** (born 1981–99; 45 million people; 10% of all active physicians)

They are mainly offspring of the Boomers. ‘Generation Y’ alludes to a succession of ‘Generation X’, but also stands for ‘Generation Why’ due to their propensity to raise questions. Currently, many of them are students and residents, with its leading edge finishing or having just finished the internship rotation. They have seen the rise of terrorism with the 9/11 attacks, and economic instability is going to be part of their growing experiences. They are also called Baby Boomlets, Boomerang Generation, Peter Pan generation, Trophy Generation, First Digital and Generation of Euro 700 (used in Europe, particularly in Greece). They have been nicknamed the ‘we connect generation’.

**Generation Z** (born 2000–present)

This is the newest generation. Their characteristics and landmarks are currently under evolution.

**GENERATIONAL DIFFERENCES AND TENSIONS**

As a result of specific landmark historical events, culturally determined experiences and individual interpretations, each generation develops their own behavioural and linguistic models that impact the interactions between age cohorts. Background differences lead to behavioural modifications and the consequent potential for intergroup misunderstanding and friction. The current physician workforce includes mainly three generations: Baby Boomers, Generation X and Generation Y. A fourth generation, the pre-Boomers, or Silent Generation, have largely retired and do not play a significant role in workplace dynamics anymore. The characteristics of these cohorts should be compared and understood. Particularly, since GenYers are the offspring of the Boomers, their interactions could be interpreted as a typical parent–child conflict.

Baby Boomers grew up in a large and highly competitive environment; competition was crucial within their classrooms and beyond. They tend to embrace the culture of their workplace. They seek promotions and expect to lead, with all the responsibility, authority and economic enhancement it brings. Their careers are an essential part of their lives, signifying the reason for their acceptance in society. They favour incentive programmes based on employment length and rewards for productivity. They communicate through formal meetings, formal letters and phone calls, while emails have only been adopted in the recent past. Dress is business formal attire. They augment their education with printed journals, textbooks and continuing medical education events. They feel the need to continuously move up the leadership ladder in order to gain opportunities to control their working environment. They tend to be loyal to their employers; they want others to work with and accept the chain of command. Moreover, they care about the opinions of others and accept constructive criticism.

Generation X shows a more relaxed approach to work. They consider their job to be a way to make their living and achieve personal goals. They are not interested in becoming the boss; they want to learn new skills, but as soon as the work environment becomes undesirable, they tend to move on to a new job. They focus on technology, conducting internet research to supplement their knowledge. They also demand tangible benefits from memberships in professional societies. They need to be impressed by their bosses, independently of his or her professional titles or years of experience. The value of a boss is also based on his or her ability to assist them in achieving individual goals. Furthermore, the tendency to ask why, which began in school, persists while being part of a structured workforce [2]. This cohort discourages micromanagement, demands explanations and is likely to bring new skills and technology to its work environment.

Generation Y is the current applicant pool for residency programmes. The young adults of this generation are known to be incredibly sophisticated, technologically savvy and immune to most marketing and sales pitches. Being much more racially and ethnically diverse than previous generations, they embrace diversity. They are segmented as an audience, aided by the rapid expansion of cable television channels, satellite radio, the internet and online magazines. They are able to carry out any transaction via smartphone and are likely to embrace the integration of credit cards into their handheld devices. Many of them were raised in dual-income or single-parent families and have often been involved in family decisions for purchases. They experienced a childhood that emphasized a team-based approach, with credit for victories and achievements being distributed to all members of a team (I win, you win; they are also called the ‘trophy generation’). Essentially, there were no losers in their competitions. They are familiar with highly technical but informal communication styles, using smartphones, texting and social networks to manage their personal and professional lives. They tend to spend more time on homework and less time on watching television on the weekends. GenYers are terrific at ‘just-in-time learning’, they get what they need from their devices when they need it.
instead of memorizing all the ‘useless’ information that the previous generations had to do. They tend to function best within a group. They rely upon frequent positive feedback and anticipate promotions and pay raises at frequent intervals. Residency hour restrictions (80 h in the USA and less in Europe) are the norm. Generation Y expects a reasonable work-life balance. This cohort is likely to use some of its additional time off for volunteerism and medical mission trips [7]. They are interested in part-time positions. They need a clear sense of identity within their group, a voice at the table of leadership and the feeling and belief that the positive influence of their work will add value and produce a change within their working environment; they want to either make a business or break it. Their nature, often characterized by curiosity and a desire for adventure, tends to translate into frequent job changes. This tendency is unfortunately enhanced by the economic recession. This is the first generation that made flexible working hours and remote working possible. Modern young people are audacious enough to turn their hobbies into professions; the number of bloggers, photographers, freelance journalists, artists and designers is growing rapidly, mostly due to the development of the Internet. They want to travel, learn and challenge themselves and society, but at the same time they are becoming competent and successful professionals. Only a few of them are interested in taking on the cost, challenges, economic uncertainty and lifestyle of a physician-owned practice [8]. Overall, Millennials are reversing the long-term direction of change.

UNDERSTANDING GENERATION Y’s HIERARCHY OF NEEDS

This generation needs, requires and asks for a complete restructuring of educational models and workplace rules; understanding their hierarchy of needs and mechanisms for job satisfaction is crucial to achieving constructive interactions with them. There are several theories and methods to assess human needs and job characteristics, expectancy and satisfaction. In 1954, Maslow described what is now the best known assessment of human needs in his book Motivation and Personality [9]. His hierarchy of human needs is often portrayed as a pyramid, with the most fundamental needs at the bottom and the need for self-actualization at the top [10, 11]. It is curious that, although the pyramid has become the de facto way to represent his theory, Maslow himself never used it to describe and report it. The most fundamental and basic four levels of the pyramid contain what Maslow called ‘deficiency needs’ or ‘d-needs’, which are esteem, friendship, love, security and physical needs. If these d-needs are not met, the individual will feel anxious and tense. According to Maslow, the most basic levels must be met before each of us begins to strongly desire the secondary or higher levels of needs. He coined the term ‘Metamotivation’ to describe the motivation of people who go beyond the scope of the basic needs and strive for constant betterment [12]. The perceived need for self-actualization can be explained by a quotation: ‘What a man can be, he must be’. This quote refers to what an individual’s full potential is and its consequent realization. It is the desire to accomplish everything that we can and become the most we can be. This is different for each of us (i.e. dreaming to become a parent, an athlete, a painter, an inventor, a surgeon etc.). As previously stated, according to Maslow, to understand this level of needs, we must not only achieve the previous needs, but also master them.

The Generation Y stereotype of the approach to higher level needs has a logical basis in the way they were parented during childhood and adolescence. They are mainly the offspring of Baby Boomers who were active parents heavily involved in Generation Y’s upbringing; they ferried their children from event to event, supported them with their homework, helped them with applications and gave them a high sense of self-worth. The Americans created the term ‘helicopter parents’ to describe the heightened vigilance of these parents, a behaviour that has even led some to take issue with the managers who do not hire their children. These children experienced continuous positive feedback and understanding from adults, and their parents answered all their needs. They certainly have had little experience with frustration and having to wait. In other words, in the Western World, parents have provided most of the basic needs for this generation. Achieving physiological needs as well as safety and security has never been a priority for these individuals because they have never known life without them. They had a comfortable start to life; in comparison, most of the previous generations have battled for their needs, even facing war and poverty in the process. This has allowed Generation Y to progress quickly up the hierarchy of needs, getting to the level of self-actualization much faster and at a younger age than the previous generations. This is why the Baby Boomers view the Millennials as impatient and spoiled, favouring a typical parent–child relationship and conflict. From their caricature, they are considered self-actualizers able to move directly to addressing their high-order needs. Moreover, they are painted as a high-maintenance generation ready to immediately change rules and join the leadership table. Their distinctive characteristics are displayed in Table 1. However, this was the caricature of Generation Y before the recent prolonged economic recession, a time when they did not fear unemployment, having every belief in its ability to secure alternative employment if the need arose. Today, more than half of Generation Y’s recent graduates move back to their parents’ homes after receiving their degrees. That cushion of support gives them the time to pick the job they want. Knowledge of their basic characteristics and their evolution is crucial to adapting and preparing the academic world and the workplace for the arrival of the Millennials. We have to keep in mind that, beyond education, training and motivation, they need to be inspired.

EDUCATION AND TRAINING IN SURGERY

Unfortunately, there is very little research suggesting what current teaching and mentoring strategies work with Generation Y [13]. Since almost no literature has been published on millennial medical students and residents, surgical residency programmes

Table 1: Baby Boomers versus Generation Y

<table>
<thead>
<tr>
<th>Baby Boomers</th>
<th>Generation Y</th>
</tr>
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<tbody>
<tr>
<td>Assume diversity</td>
<td>Celebrate diversity</td>
</tr>
<tr>
<td>Pragmatic/idealism</td>
<td>Optimistic/realistic</td>
</tr>
<tr>
<td>Self-expansive</td>
<td>Self-inventive</td>
</tr>
<tr>
<td>Reject rules</td>
<td>Rewrite rules</td>
</tr>
<tr>
<td>Topples institutions</td>
<td>Irrelevance of institutions</td>
</tr>
<tr>
<td>Laisse faire kids</td>
<td>Nurtured kids</td>
</tr>
<tr>
<td>Freedom to seek to achieve</td>
<td>High expectations</td>
</tr>
<tr>
<td>Future is now</td>
<td>Future is open</td>
</tr>
<tr>
<td>Categorization</td>
<td>Personalization/customization</td>
</tr>
</tbody>
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should borrow successful strategies from the business world in order to attract, recruit, educate and manage them. The key to success is to allow these individuals to actively participate in the construction of a new vision. This is in line with the creation of entrepreneurial universities encompassing a third mission of economic development, in addition to research and teaching. We have to rethink education, critically review it and adapt it to the characteristics and needs of new generations. It is important to understand that while the educational goal does not change from one generation to the next, the method used to achieve it must evolve.

Education in medicine was founded on the concept of apprenticeship, giving great importance to the influence of the school, the institution and mentors. Previous generations of residents used to work for hundreds of hours in the shadow of the mentor they chose, absorbing his ‘art’ day by day, like the apprentices of master painters did centuries ago [14]. They had to bear physical fatigue, the pain of the bridle and the stick, and even the vexations of their tutors. This status was meant not only to give them a solid cultural and technical background, but also to forge their temper, as a sort of natural selection process achieved by the ‘carrot and stick’ method: only the toughest could survive. Cardiothoracic surgeons have long been considered as lonely mythological heroes able to take difficult decisions on their own in a matter of seconds.

The mentor–mentee relationship is extremely sophisticated, much like parenting. No one is born with the natural ability to be a parent. Parenting and mentoring skills require the same interactive process of learning and teaching: it is a two-way experience with both parties evolving their capabilities together. Mentoring, like parenting, requires time and dedication, taking energy and physical, emotional and intellectual resources. Mentors, like parents, are supervisors, administrators, coaches, teachers, friends and, eventually, role models. The environment is crucial; just as optimal parenting can only be accomplished within a family setting, mentoring requires a team of ‘protectors’ that takes care of the mentee. No physician can achieve success while working alone; we are ‘non solus’ [15]. Successful mentoring can only be accomplished through a team-based approach, which ensures the highest safety and quality of care, and allows interaction, exchange of information, support and even protection. Eventually, the success of the mentee will be the metric of successful mentoring. The transition from mentee to mentor takes a long time, but it is certainly the final goal. We should remember that learning surgery is a lifelong process; however, there will be a time for each of our mentees to ‘fly alone’, leaving the group in which he or she has been growing in order to work independently, like a child leaving his parents to raise his own family. The essence of this process is always the same, but each generation requires an evolution of its details. The notion of the mentor as a role model is completely different for GenYers. The most important qualities they look for are a positive, paternalistic attitude towards junior colleagues, compassion for patients, integrity, and clinical competence and skills. Moreover, enthusiasm for subject matter and teaching ability are much more important than achievements in research and academic status [16]. Other attributes that GenYers value less are publications, success in receiving grants, senior management roles, service development, professional leadership, power, social status and high earnings [16].

We have always considered residency programmes to be synonymous with training. However, it is now clear, especially with this generation, that there is a big difference between training and educating, as well as between being trained and becoming educated [17]. The principles of each are related, but their aims are different. Bloom’s Taxonomy [18] is the fundamental concept of modern education. It states that competence is attributable to three domains: knowledge, skills and attitudes with a hierarchy of acquisition starting at the very basic and increasing to the very advanced. The aim of education is clearly broader than training. This also implies the concept of the ‘transfer of learning’, which means the ability to take an area of learning from one environment (i.e. the classroom, labs etc.) to another (i.e. the operation theatre). This is the point where education and training, in terms of technical skills, do overlap. It is a left brain–right brain concept that can be easily represented by the process of learning to drive a car.

Teaching methods utilized for past generations may not be successful for the Millennials. The human mind should not be considered a container to be filled but a fire to be kindled; the good educator tells, explains, demonstrates, involves, engages and eventually inspires. ‘Inspiration’ is the key to success with Generation Y. It is a difficult and subtle psychological approach that goes beyond mentoring and simple motivation. It is a process that should eventually promote reflection and thoughtful insight for future research areas by the mentee and allow him to overtake his mentor. Only through assisting the new generations on the road to independence and rejoicing in their successes will we be able to interpret our role correctly and enable them to achieve the final goal: to become a man/woman of value, not only of success. The perfect mentor should arouse interest, curiosity and criticism in their students and residents using all the methods and formats they are familiar with, like parents do with their children. When we embark on this process, the first step is to start to speak the same exact language, a task that will be quite challenging for all of us. Terminology changes among generations, with new expressions and idioms, and this must be learned. Many medical educators have already adopted some of the following suggestions.

**Technology**

The current global flow of information and knowledge represents a revolution similar to the one that gave impetus to the Renaissance. At that time, Gutenberg’s printing press allowed for a dramatic increase in the amount of circulating information. Today, the Internet has provided a similar but more forceful push in the same direction, leading to the truly global diffusion of knowledge. As a result, Millennials are less likely to go to the library or buy textbooks. We have to invest in modern forms of media: online learning modules, CDs, blogs, vlogs, online question banks and podcasts. Nowadays, if someone wants to see how an operation is performed, it is no longer necessary to leave home and travel. Everything is available on CTSNet, YouTube and other video-streaming websites. Online videos should be available at every institution, including full-length procedures. Also, educators will be judged by Millennials according to their ability to keep abreast of new technologies and incorporate them into the teaching process. Didactic lectures should at least incorporate multimedia, case presentations and audience interaction; PowerPoint presentations are by now considered outdated. The more technology is employed, the better. Moreover, the use of simulation should be part of their preclinical training as in other fields.

**Multitasking**

This generation is used to constant interaction by smartphone, texting and emails. Multitasking activities during rounds or...
conferences may be interpreted as disrespectful. However, this behaviour is second nature for GenYers; they do not even consider that it may be frowned upon. For this reason, rules should be made clear to avoid misunderstanding and the faculty should also act as role models on this issue. However, it would be constructive to connect with them on their turf through the use of social networking, Facebook, YouTube and texting.

Team-based approach

As mentioned before, most of GenYers were raised playing on teams. For this reason, working alone represents a great potential for individual failure for them. They prefer to work on projects in cooperation with others [19, 20]. However, it is evident that only some aspects of residency core curriculum can be approached this way. Surgical education clearly poses major problems with this method. Nonetheless, a team-based approach to hospital activities should be preferred [15].

Work–life balance

Millennials desire a balance of work and life [21]. For this age cohort, the line between work and home does not really exist. They want to spend their time in a meaningful and useful way, no matter what they do. They work to live and do not live to work, as did previous generations. Among them, the number of doctors who choose to work part-time is significantly increasing. They tend to spend part of their spare time volunteering. They embrace the 80 h work week as an obvious complement to their lifestyles. In this situation, it is crucial to set rules, expectations and behaviours. Furthermore, since this generation has experienced a highly structured life since childhood with planned schooling and extracurricular activities, they require, at least at the beginning, guidance from mentors about how to balance and prioritize their multiple duties during residency [21].

Hierarchy and feedback

This generation does not recognize hierarchy, institutions and degrees, as did the previous cohorts; instead, they recognize skills. They are more concerned with the ‘now’ and how a situation can be solved practically. They do not like history lessons about institutions or how a decision was historically taken. We should start with the ‘now’ and then connect the dots to the past, retrospectively bringing their attention to its importance. They see their professors and mentors as equals and expect their supervisors to be approachable and supportive and to care about them personally, like their parents did. They do not usually consider our generation as giants over which shoulders stand [15]. They do not need us to be similar to them; it is much more important to feel how much we like them, just like real parents. They need clear goals and want rewards when they are achieved. They require immediate feedback so that they can know without any delay if they are doing right or wrong. However, they are often unprepared to receive constructive criticism and negative feedback, an attitude related to the fact that they received positive reinforcement from their parents during childhood.

**ATTRACTING AND RECRUITING GENYERS IN RESIDENCY PROGRAMMES**

Millennials are difficult to recruit and easy to lose. They are expected to switch jobs several times over the course of their careers, more than any other generation. They rely on the Internet to choose their residency programmes, at least during the preliminary steps of their research. However, there are several problems with this approach. On the Internet, all information competes equally and even the worst residency programmes can make themselves look top-notch if the appropriate technology is used. This generation is used to gathering all they need to know not from a programme’s website, but from informal discussion groups and other general websites where information travels anonymously. This process challenges institutions and now plays a key role in decision-making. Social networks, like Twitter, Facebook and Myspace, make it easier to connect people. Such mediums should be used by institutions to facilitate communication between current residents, prospective applicants, coordinators and directors. They could be enriched with dedicated webpages, videos, blogs and podcasts. In this way, even lesser known programmes can improve their reputations by stating what they stand for and what their priorities are. However, everything must be carefully validated to ensure that correct information is disseminated.

Attraction and recruiting tactics should be translated from the business world [22] to surgical residency programmes. In this process, technology plays a major role as well. This generation considers PowerPoint presentations obsolete. During interviews, if presentations are given, they should be highly engaging [22]; they should be similar to dynamic websites and include videos of residents describing their activities at that institution, including descriptions of both their best and worst days. Candidates should receive flash drives preloaded with all the information about the institution, faculty CVs, call schedules, contact information and facts about the hospital. We also have to keep in mind that GenYers are in continuous communication with their parents, requiring space for them in the decision-making process. Parents will follow along for the entire programme, demanding as well as giving feedback.

Business strategies reflect a number of principles. Our institutions should provide structure, make residents feel at home, mimic ‘helicopter parenting’ and always remember that respect is earned, not granted. Faculty should fill the parental role of always being available, stressing teamwork and providing support and a comfortable training environment. This message is timeless notwithstanding the peculiarities of each generation.

In conclusion, younger generations are offering us a unique opportunity; we should see them as agents of change without holding them back or feeling uneasy or threatened by them. Instead of labelling them as selfish or fickle, we should focus on ways to challenge new recruits on more personal levels and offer interesting opportunities. We should question ourselves, instead of remaining in an ivory tower built on our past achievements. This will certainly help to improve the quality of our work environment, to stimulate Generation Y’s passion for their work, improve our work–life balance and eventually… facilitate the evolution of our species.

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