The perceptions of anatomists in the US and Europe of the skills and attributes required of newly-recruited medical students☆

Bernard J. Moxham [a],[*], Odile Plaisant [b], Baptiste Lignier [c], Feisal Brahim [d]

[a] Cardiff School of Biosciences, Cardiff University, Museum Avenue, Cardiff CF10 3AX, United Kingdom
[b] University of Paris Descartes, Sorbonne Paris Cité, URDIA, EA 4465, Paris, France
[c] Laboratoire de Psychopathologie et Psychologie Médicale (LPPM-EA 4452), Université Bourgogne-Franche Comté, Pole AAFE, Esplanade Erasme, 21000 Dijon, France
[d] Formerly of St George's University, Grenada

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ABSTRACT

Background and purpose: Admission procedures for recruiting students to medical school vary considerably across the world. Notwithstanding such variability, it is important to know what skills and attributes (including attitudes and personality traits) are required of the students by their teachers on entering medical school.

Procedures: Anatomists are often the teachers who first meet the students as they enter medical school and this report analyses, by means of a paper-based questionnaire, the putative skills required of their medical students by anatomists from the U.S.A. and Europe. Questionnaires were distributed to 150 anatomists, of varying ages and teaching experience, with 108 responding with completed questionnaires (i.e. 72% returns).

Findings: The findings from a questionnaire suggest that there are few differences between anatomists in the U.S.A. and Europe, even though medical students are postgraduates in the U.S.A. but undergraduates in Europe. Furthermore, the skill requirements expected of the students differed only slightly according to the gender and age of the anatomists and to whether or not they had clinical qualifications. In order of perceived importance, the most important skills and attributes required of the students were found to be: good study skills, memory/factual retention, conscientiousness, emotional stability, understanding of biology (but not chemistry, physics, mathematics, statistics, or understanding of the scientific method), life-long learning skills, ability to study independently, problem-solving abilities, readiness to be challenged, communication skills, and teamwork skills.

Conclusions: Anatomists within the U.S.A. and Europe essentially agree on the skills and attributes initially required of their medical students, as well as those not deemed initially important. These findings are presented with the view of enhancing admission policies and procedures for admitting students into medical schools.

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1. Introduction

Medical education has historically undergone an evolutionary process that led to a consistent pattern for the medical curriculum across the globe for much of the 20th century. Accordingly, the medical curriculum, in common with many other healthcare curricula, consisted of 5–7 years of training, with the early years being devoted to the basic biomedical sciences. After 2 or 3 years of scientific study, the students would begin their clinical training. In the latter part of the 20th century and the early part of the 21st century, this consistency has become tenuous so that healthcare courses nowadays display many different arrangements for the study of clinical and scientific material. In our view, this situation has led, not just to a loss of consistency in medical education, but to there being potentially a loss of reliability and transparency that could raise issues about the quality of medical education by stakeholders in society (e.g. government). In addition, this process has been 'revolutionised' by largely untried educational methods but, of greater significance in terms of the present debate, is the realisation that we have little knowledge or understanding of the expected skills, knowledge base, learning styles, and attributes (including attitudes

and personality) of the students that we recruit to medical school. Indeed, it seems to us that often teachers either do not know the skills that students bring or, thinking that they are dealing with a student as a *tabula rasa*, do not particular believe that knowledge of their skills is needed. This situation is highlighted by the fact that there is great diversity across the world with respect to admission procedures and entry requirements for medical school (e.g. Patterson et al., 2016).

In debates on medical education, there is always the risk of falling into the trap of slinging the epithets of 'old-fashioned' or 'trendy' into the mix. However, it is not a case of just discussing what is 'traditional' or 'modern' in terms of the methods of delivering medical education, which is where much of the argument appears so far to have taken place. Consideration should also be given to the attitudes, personal characteristics (including personality) and learning styles of today's student. In this paper, we outline what anatomists consider should be the core skills and attributes necessary for newly-recruited medical students to benefit properly from a university-based medical education. That we have studied the beliefs of anatomists comes from the fact that these teachers are often the first to meet and teach newly-recruited medical students and also from recent developments where anatomy courses have changed to include, not just a knowledge base for human structure, but attributes relating to the development of professionalism (e.g. Escobar-Poni and Poni, 2006; Swick, 2006; Swartz, 2006; Moxham and Moxham, 2007; Patel and Moxham, 2008; Wittich et al., 2013). Boeckers and Boeckers (2016) suggest that "professionalism includes characteristics such as altruism, empathy, respect, honesty/integrity, responsibility, desire for excellence, and selfreflection". We agree, to which we would add conscientiousness, life-long learning skills, independent study and problem-solving abilities, communication skills, team working, understanding moral frameworks, and practical skills.

Given that our survey involves anatomists in Europe and the US, with different ages and different teaching experiences, and with or without clinical qualifications, our study aims to assess the following four hypotheses:

1. Few skills were required of medical students on entering medical school by anatomists.
2. Marked differences in skill requirements are expected when comparing US versus European anatomists since US medical students enter medical school after graduating from university whereas most medical students enter European medical schools straight from secondary school.
3. Anatomists who have many years of teaching experience require less in the way of skills from the newly-recruited medical students than less experienced (younger) anatomists.
4. Anatomists who are clinically qualified require more skills from newly-recruited medical students than anatomists who have just scientific backgrounds.

2. Methods

The questionnaire devised was paper-based and not distributed online. It was reviewed by all the authors and seen by a group of 10 academics not involved in the survey to assess the extent to which it communicates and is understandable and also to gauge its accessibility in terms of equality and diversity. A translation of the questionnaire into French was undertaken by the authors who are native French speakers. The lead author, who is a native English speaker, then reviewed the French translation to ensure that there was consistency between the French and English questionnaires.

Questionnaires were distributed to anatomists from the U.S.A. the U.K., France, Spain/Portugal, Italy, and Eastern Europe. The

Table 1

Demographic	Number (percentage)
European anatomists	67 (62%)
US anatomists	41 (38%)
Male anatomists	80 (74%)
Female anatomists	28 (26%)
Clinically qualified anatomists	57 (53%)
Not clinically qualified anatomists	51 (47%)
Teaching experience 11 years	39 (36%)
Teaching experience 11–20 years	22 (20%)
Teaching experience 21–30 years	23 (21%)
Teaching experience 31–40 years	18 (17%)
Teaching experience >40 years	6 (6%)
Teaching experience up to 20 years	61 (56%)
Teaching experience greater than 20 years	47 (44%)

distribution was organised by designated anatomists who were officials of national/international societies. The distributors were asked to ensure that questionnaires were provided to young anatomists as well as to established anatomists with long teaching experience (see Table 1 for the outcome in terms of demographics). The timeframe for return of the questionnaire did not exceed one month. The questionnaires were returned to the lead author and care was taken not to interfere with the distribution, or with the returns, to ensure confidentiality and anonymity, both for the individual and for the medical schools. Indeed, with the exception of those who answered the questionnaire in French, the lead author was only aware as to whether the anatomist responding was US- or European-based. This study received ethical approval from the Institutional Review Board at St. George's University, Grenada (SGU IRB Application 14031). Thus, in addition to ensuring anonymity and confidentiality, no vulnerable groups were included in the survey, and participation was voluntary and consensual.

Fig. 1 lists the skills and attributes included within the questionnaire. The list was compiled by the authors and included attributes to describe personality traits that are derived from the BFI (Big Five Inventory) commonly used by psychologists and educationalists to assess personality (i.e. openness, conscientiousness, extraversion, agreeableness and negative affectivity/neuroticism) (John and Srivastava, 1999; Plaisant et al., 2011, 2014). The respondents were required to judge the importance of each skill/attribute, scoring between 0 and 10, where 0 was deemed to be not needed and 10 was thought to be required at a very high level.

To analyse the data statistically, Microsoft Excel was employed for creating graphs and conducting simple calculations. MINITAB, SPSS, and SAS were used to run statistical tests. Given that more than 30 subjects per groups were recruited, parametric t-tests are appropriate to compare two groups (US vs EU anatomists, etc.) and ANOVA to compare more than two groups. Furthermore, as our groups are larger than 30 subjects, we used Pearson's correlations when discerning links between two numerical variables. We employed traditional significance levels of $p \ll 0.05$.

3. Results

One hundred and fifty questionnaires were distributed and one hundred and eight completed questionnaires were received by the lead author for analysis. There was thus a 72% response rate. Table 1 describes the demographics of the respondents. It might be considered that if 47% of respondents had more than 20 years experience then this is not 'representative' of the population. However, it follows that 54% have less than 20 years experience. Indeed, as shown in Table 1, the largest group had 10 or less years experience.