Teaching basic sciences to medical students in a dynamic scientific environment: Educator perceptions and practices

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INTRODUCTION

- 110 hour decrease in basic science education in Year 1 and 2 in US medical schools between 1993-1994 and 2003-2004
- Yet, emergent molecular and genetic technologies have revolutionized our understanding of normal physiologic processes and the pathophysiology of many disease states.
- This new knowledge has often led to new treatments within a short time span and is already impacting future clinical practice of current medical students.
- No prior research on how Basic Science Educators (BSE) perceive the pace of scientific change in their respective disciplines and how these changes are impacting their teaching now.

We hypothesized that rapid changes in fundamental understanding of biological systems are influencing the ways BSE teach Year 1 and Year 2 medical students- for example, increased use of journal articles as sources of information. We sought to answer two research questions:

1) How do Basic Science Educators in Medical Schools in Georgia perceive and approach a dynamic scientific environment? and
2) How is the BSE approach to a dynamic scientific environment reflected in their teaching?

AIMS & OBJECTIVES

- To describe how BSE who teach in medical schools in Georgia, and who are trained in different scientific disciplines, perceive the pace of change within their respective disciplines and how this is reflected in their teaching of Year 1 and Year 2 medical students
- To determine if teaching objectives and the information provided to Year 1 and 2 medical students vary according to the primary activity of the BSE, either as a researcher or educator
- To ascertain if the BSE’s perception of the rate of scientific change within their discipline is reflected in the extent of his/her use of scientific journals as a main source of information to teach medical students
- To determine if BSE assessment of how much new understanding is not present in recommended textbooks is likened to their perception of the rate of scientific change within their respective disciplines
- To describe the main factors that guide whether or not BSE teach Year 1 and Year 2 new scientific information from journals in their discipline
- To describe the main criteria used by BSE in selecting information from scientific journals to teach Year 1 and Year 2 medical students

METHODS

- Faculty listed in basic science departments at six Georgia medical schools were contacted via email to participate in this IRB-approved survey study
- A 22-item questionnaire, developed by the authors, assessed:
  - Participants’ background information
  - Perception of discipline knowledge change, and
  - Criteria for selecting teaching content
- Descriptive analyses are presented for respondents’ perception of rate of knowledge change in their disciplines, amount of new knowledge not present in textbooks and criteria used to select teaching content from journals.
- The Fisher exact probability test, was used to assess differences between participants who were predominantly teachers or researchers (i.e. >50% of their FTE) and the amount of content taught from journals

RESULTS

Respondent Demographics
In total, there were 98 respondents with males representing 2/3 of responses (n=64).

Figure 1. 70% of respondents have taught for 6 or more years

Perception of Scientific Change in Discipline

Figure 2. 80% of respondents perceive a rapid rate of scientific discovery in their disciplines as indicated in responses to the following question: I think the rate of scientific discovery in my discipline is best described as:

Table 1. On average respondents took 26% of information taught to Yr 1 and Yr 2 medical students directly from scientific or biomedical journals, as indicated in responses to the following question:

Table 2. Respondents who are primarily researchers use significantly more content from scientific journals than those who are primarily teachers

CONCLUSIONS

Our results indicate that BSE at Medical Schools in Georgia,

- Perceive a rapid rate of knowledge change in their respective disciplines,
- Acknowledge large gaps in knowledge in recommended textbooks,
- Over 1 in 5 respondents assess this gap at >40% of current understanding
- Report that about 25% of information taught to medical students is taken directly from scientific &/or biomedical journals
- But, very wide variation from nothing to everything taught
- Primarily select journal material that provides understanding of a fundamental process &/or provides insight into body function or disease process,
- Respondents who spend >50% FTE on research use significantly more journal content (p <0.01) to teach Year 1 and 2 medical students than respondents who spend >50% FTE teaching

Our current results are limited by a low response rate of only 26% of BSE in Georgia and the fact that all respondents are from medical schools in one state. We hope to enlarge on our findings by expanding our online survey to Basic Science Educators in medical colleges in other states in the USA.

REFERENCES

Norman, G. 2007. How basic is basic science? Advances in Health Science Education 12: 401-403.