

Alleviating the Current and Future Workforce Shortage Through Sustainable Education: A Proven Revenue- and Cost-Share Financial Model for Medical Physics Graduate Programs

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ABSTRACT

Purpose: A cost- and revenue-shared model is an implementable solution to establish a sustainable, financially-sound medical physics graduate program allowing for proper long-term planning and consistent growth while assuring high quality education and training of students.

Methods: The lack of sustainable financial models for medical physics graduate programs (MPGPs) results in inadequate funding for faculty salaries and continues to jeopardize many programs impacting the quality of education they provide. MPGPs where multiple clinical and academic departments participate present an opportunity for implementing a sustainable cost- and revenue shared model. Tuition becomes an important source of revenue, as it allows for proportional revenue allocation based on individual and departmental Educational Relative Value Units (eRVUs). In turn, this allows for implementation of a cost-share approach, where individual departments can partially offset the salary expenses from educational FTEs as well as those of graduate assistantships. Other costs, such as use of clinical systems for hands-on educational activities can also be offset by establishing service contracts in exchange for machine time.

Results: Our institution implemented this model in 2017. The number of faculty members from the participating departments has doubled ever since. Growth has been consistent, from eight Ph.D. and five M.S. students in 2017 to the current twenty-five Ph.D. and seventeen M.S. students

Conclusion: A cost- and revenue-shared financial model can be implemented in many multi-departmental MPGPs, resulting in steady graduation and placement rates and assuring high-quality education under a sustainable financial environment.

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INTRODUCTION

The alarming decrease in funding that all higher-education institutions have experienced in recent year has of course affected Medical Physics Graduate Programs (MPGPs) significantly^{1,2}. In particular, the lack of sustainable financial models in MPGPs results in inadequate support for faculty salaries and student funding which continues to jeopardize the quality of education MPGPs provide. The medical physics educational community is trying to develop strategies to help MPGPs establish sustainable financial structures which can allow programs to continue their extremely important mission to the profession. Both the Educational Council of the AAPM and the Society of Directors of Academic Medical Physics Programs (SDAMPP) continue to publish articles and conduct workshops and webinars for this purpose. In particular, programs in which multiple departments participate face severe faculty underfunding problems which lead to undesirable scenarios of overworked and dissatisfied faculty and students. However, the hybrid clinical and non-clinical operations of participating departments present an opportunity for implementing a sustainable cost- and revenue shared model.

METHODS AND MATERIALS

Upon transferring to the College of Medicine in 2017, the leadership of the University of Florida MPGP implemented a cost- and revenue-shared model in order to establish a sustainable, financially-sound structure which allows for proper long-term planning and consistent growth while assuring high quality education and training of students. External funding notwithstanding, our program utilizes student tuition (frequently overlooked) as a source of revenue for the participating departments as it allocates revenue proportionally based on individual and departmental Educational Relative Value Units (eRVUs). The eRVU model provides a tangible revenue contribution from MPGP faculty. This has enabled chief physicists in all participating departments to implement funded full-time equivalent (FTE) allocations as well as budgeted educational effort assignments for all participating faculty, thus effectively implementing a cost-shared approach, as individual departments can offset, at least partially, the salary expenses from educational faculty FTEs as well as graduate assistantships. Other costs, such as those to permit use of clinical systems for hands-on educational activities are also offset by established service contracts by which MPGP faculty provide clinical support activities to the UF Health hospital and clinics in exchange for use of clinical systems for student training and research purposes.

Table 1. Typical faculty FTE academic semester assignments for educational effort

EDUCATIONAL ASSIGNMENT	FTE ASSIGNED BY	FTE	TYPICAL NUMBER OF CREDITS	TYPICAL TOTAL FTE
Didactic course:				
Course director	Course section	0.04/course section	-	0.04
Instructor (*)	Course section	0.046/credit	3	0.14
Research advisement credits for:				
MS student	Nunber of students	0.02 per credit	3	0.06
PhD student	Number of students	0.02 per credit	9	0.18

(*) If there are multiple instructors in a course, FTE is assigned proportionately to percentage of lectures/labs taught per instructor

Table 2. Sample of overall FTE annual assignments per participating department in MPGP

DEPARTMENT	NUMBER OF CLASSROOM COURSES DIRECTED OR TAUGHT	FTE FROM CLASSROM COURSES	NUMBER OF MS AND PHD STUDENTS	FTE FROM STUDENT ADVISING	TOTAL FTE	ESTIMATED PERCENTAGE REVENUE SHARE
A	10.67	1.64	7	2.52	4.36 (^)	0.33
B	1.34	0.22	3	1.20	1.42	0.11
C	1	0.18	7	2.76	2.94	0.21
D	1	0.18	9	3.84	4.02	0.30
E	-	0.00	4	0.72	0.72	0.05
TOTAL MPGP	14	2.22	30	11.04	13.46	100

(^*) Includes 0.2 FTE for MPGP program director

TABLE 33. Number of MPGP faculty and educational FTE assignments

DEPARTMENT	TOTAL CLINICAL AND EDUCATIONAL FACULTY FTEs	ASSIGNED EDUCATIONAL FTEs	NUMBER OF GRADUATE STUDENTS	NUMBER OF FUNDED GRADUATE STUDENTS
A	6	4.36	7	4
B	4	1.42	3	1
C	7	2.94	7	3
D	1	4.02	9	7
E	1	0.72	4	2
TOTALS	19	13.46	30	17

RESULTS

Table 1 shows the assigned FTEs resulting from implementation of the eRVU model. Table 2 shows how the program has established the share of revenue which in turn, leads to an agreed sharing of salary expenses for both faculty and graduate assistants as departments assume responsibility for funding these. As a result, the number of faculty members from the participating departments has doubled since 2017. Growth has been consistent, from 8 Ph.D. and 5 M.S. students to the current 25 Ph.D. and 17 M.S. students; with retention and residency placement rates of 98 and 92 percent.

DISCUSSION

The revenue-sharing model allows for faculty participating in MPGPs to be formally assigned educational FTEs as part of their annual assigned workload. When compared to MPGPs where faculty perform educational activities on a volunteer basis, the financial recognition of educational efforts in our model has a significant impact on job satisfaction.

CONCLUSIONS

A revenue- and cost-shared financial model can be implemented in many multi-departmental MPGPs in the country, resulting in steady graduation and placement rates and assuring high-quality education under a sustainable financial environment. This financial model rewards participating departments financially, stimulating departmental and faculty participation in the program, which ultimately impacts the quality of education provided to MP students.

REFERENCES

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