# Faculty Development Program effectiveness in educational events

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# Abstract

Background

Developing clinical and biomedical science faculty to become effective teachers is critical to meet the challenges of medical education. Education research is at a stage in which we have strong theories of student learning, but we do not have well-developed ideas about teacher learning, nor about how to help teachers incorporate new ideas into their ongoing systems of practice. We aim to study the AOSpine Faculty Development program, which consists in a series of training programs at progressive levels.

Methods

Retrospective study from a prospective database. The information for Faculty performance (national, regional and international) in all AOSpine educational events from 2008 to 2016 was retrospectively reviewed. Additionally we developed a supplementary survey with the participants in 2016. It covered demographic topics and 4 specific questions regarding (1) quality expectations for CME programs, (2) AOSpine events highlights, (3) what could be improved in AOSpine events, and (4) activities of interest.

Results

We’ve accessed scores from 646 professionals (n=646) in 7,962 evaluations from 2008 to 2016 using a five-point Likert scale. 798 participants replied the 2016 survey from 20 countries of the region. The evaluation for a national Faculty was 4.42 points, the regional 4.56, and for the international faculty 4.53. The mean punctuation for the master course was 4.25, for advanced 4.44, and the value of 4.48 for principles. The Chair Training promoted an increase of the evaluation from 4.44 to 4.52 ($p = 0.022$)

Conclusion

The appliance of a Faculty Development Program based on educational strategies directly affects the outcomes of educational events. The 8-years systematic review showed continued improvement of the trained faculty evaluations in all levels.


# Background

Developing clinical and biomedical science faculty to become effective teachers is critical to meet the challenges of medical education.Thus, faculty development (FD) is essential to prepare faculty members in preparation for the change. FD was initially conceptualized as strategies to improve teaching performance.[1]Now it is recognized by many medical education organizations as an essential support framework provided to faculty members to assist them in responding to the challenges of their multiple roles and evolving responsibilities.[2]It has been also defined as that broad range of activities that institutions use to renew or assist faculty in their roles, and includes initiatives designed to improve the performance of faculty members in teaching, research and administration.[3]Education research is at a stage in which we have strong theories of student learning, but we do not have well-developed ideas

about teacher learning, nor about how to help teachers incorporate new ideas into their ongoing systems of practice.[4]

It is well documented that FD promotes and contributes to faculty members' teaching knowledge, behaviors, and skills, rekindling their motivation to change their attitude towards embracing effective learning strategies.[1]Although FD encompasses broader components such as educational research, curriculum development, and education leadership, the major impacts most educators elucidated were still on teaching and learning such as changes in teaching approaches and developing an awareness of the learning process.[1]For example, our findings suggest that FD programs are beginning to move away from a focus on teaching performance alone toward a variety of objectives, often within the same program. Programs are increasingly aiming to assist faculty with their scholarship, leadership, and career development needs, in addition to their teaching skills.[2]Teacher education programs must now train teachers to work in environments that will demand increasingly complex skills and knowledge, along with greater accountability and demonstrated teaching effectiveness.[5]Faculty development programs on clinical teaching skills have previously been shown to be well received and to improve knowledge of teaching concepts and strategies as well as confidence in teaching.[6]The second important feature of a FD theory of action has to do with how it helps teachers translate new ideas into their own systems of practice. Many authors of FD studies reviewed cite the importance of content knowledge as a rationale for their programs.[7]

Faculty development is also meant to improve practice and manage change by enhancing individual strengths and abilities as well as organizational capacities and culture.[3]Some concepts we can highlight are that learners' need to know—they need to see how the educational activities are relevant to their lives or careers –,learners' self-concept—they can resent or resist situations which feel like impositions of others' wills –, role of learners' experiences—emphasis should be on experiential techniques that tap into these experiences, such as group discussions, simulations, and problem-solving and peer-helping activities –, readiness to learn—if they understand why they are learning something, adults come ready to learn it –, orientation to learning—most effectively in the context of real-life situations –, and learners' motivation—intrinsic factors (e.g., increased personal happiness or satisfaction) can be more powerful motivators to learn new things.[4]Others recognized designs include practice teaching[5], collective participation, and program intensity.[7]In this article, we aim to study the AOSpine Faculty Development program, which consists in a series of training programs at progressive levels. We will focus more deeply on the Faculty Educational Program (FEP), and evaluate its outcomes in the learning process.

# Methods

The Faculty Development Program designed by AOSpine is a pathway through several training programs to improve teaching and knowledge skills. It is divided into three training levels: Faculty, Chairperson, and Educational Advisor. The programs are based on the AOSpine curriculum. The Curriculum is a learning framework which encompasses content from six areas of spine pathology, delivering knowledge based

on competencies and learning outcomes. AO's educational strategy is defined by the integration and interdependency of four key aspects of education.

These key aspects are:

- clearly defined Educational plan,
- facilitated by Assessment,
- supported by relevant Resources, and
- driven by Faculty development.

The intersection of these aspects creates the competencies that our curricula are based on. Competencies (or abilities) are a combination of the specific knowledge, skills, and attitudes that enable surgeons to effectively perform in their practice, setting and meeting the standards of the profession.

## Ethics

The present research do not need approval by the Ethic committee according to national regulations.

## Educational Program for faculties

## Faculty Educational Program (FEP)

Practical training aimed for spine surgeons who want to improve skills, knowledge and experience in the educational plan. It runs through many teaching techniques. The main goals of the program are:

## Methods and Teaching techniques

- Present a class
- Manage a discussion group
- Manage practical exercises

## Work with the students

- Motivate the participants
- Stimulate interaction among participants of a course
- Give proper feedback

## Proper appliance of evaluations and outcomes information

- Proper use of the participant's information, its needs, and cultural context in the educational process
- Work the results in teaching techniques
- Set reasonable expectations for a teaching lesson
- Evaluate and improve its own performance as a Faculty

## Training description

The FEP is a blended learning program separated in three parts: 1. Online activities, 2. Face-to-face course, and 3. Post-course activities. (Fig.01)

## Online activities

The online activities are developed five weeks prior to the face-to-face event. During this period the students must accomplish a self-evaluation, several online activities, and take part in an online forum. The goals of this first part are to set an educational base on how adults learn and how to present a class, carry out practical exercises, and manage group discussions. The students are also stimulated to use the online platform to start to know the other participants and interact with each other.

## Face-to-face event

The face-to-face event is a 1.5-days of immersive activities. It starts with clearly explanation of the AO standards of teaching quality. Following, each participant must:

- Give a 7 minutes presentation
- Manage a discussion group for 10 minutes
- Manage practical exercises

In the end, each student receives a detailed feedback of the Faculty and all the other students. These sessions are recorded on video to improve the student's teaching skills.

## Post-course activities

It starts with a self-assessment followed by different interventions through online forums.

## Chairperson Educational Program (CEP)

Program focused on teaching methods, logistics, relationship with third party allied, and faculty management. Equips course chairpersons with the skills and tools to adjust the Principles and generic course templates according to the learners' needs. Because this is progressive training, all the

participants to the CEP need to previously attend to the FEP. The program encourages participants to work with their own course material and implement their skills and knowledge in the areas of course development, assessment, and evaluation. The main goals of the program are:

- Describe the role of the course chairperson and the corresponding tasks–before, during and after an educational event.
- Select appropriate content from the templates that addresses the learners' gaps.
- Select different teaching methods and sequence them appropriately.
- Use the data from assessments to adjust the program templates based on learner needs.
- Appropriately assign faculty based on expertise, experience, and principles of effective teaching.
- Manage faculty including early communication as part of pre-course activities and regular faculty meetings throughout the educational activity.
- Conduct evaluation activities and analyze the results.

## Program description

The CEP is also based on a blended learning structure separated in three parts: 1. Online activities, 2. Face-to-face course, and 3. Post-course activities.

## Online activities

Online activities developed four weeks prior to the face-to-face event. It includes self-assessment, online self-study, and discussion. Course topics include "Chairperson's role and tasks", "Addressing learners' gaps", and "Faculty management". Interaction is encouraged via the online forums.

## Face-to-face event

The face-to-face event is a 1.5-days of immersive activities. It is mainly based on interactive sessions. Beginning with early communication and pre-course activities, all participants receive detailed feedback on their course planning from the group and the faculty/educator.

## Online follow-up

After the face-to-face event, self-assessment is initiated and participants are being encouraged to contribute to the ongoing online discussion.

## Types of faculties

The roles at the events may include National Faculty (people from the country of the event), Regional Faculty (foreigner of the region), and International Faculty (foreigner outside the

Region). Not every National Faculty previously attended a Faculty Educational Program (FEP). However, every Regional Faculty and International Faculty had to be formally trained to hold this position in an educational event. To hold the role of Chairperson, the Faculty must have previously attended a CEP and the FEP.

## Study design

Retrospective study from a prospective database. The information for Faculty performance (national, regional and international) in all AOSpine educational events from 2008 to 2016 was retrospectively reviewed.

## 360° of the Course Assessment

*Participants:* AOSpine develops CME programs in three levels: (1) principium, (2) advanced, and (3) master. In every event, all the participants are invited to fulfill pre and prost-assessments focused on personal needs and expectations—addressing overall information regarding the educational event. The participants evaluate the Faculty performance and the overall event. To assess participant's degree of satisfaction about the faculty performance, participants respond using a five-point Likert scale, ranging from 1-Bad to 5-Excelent, to each Faculty at the event. To do so, they are oriented to use the following guiding questions:

- Did he/she refereed the subject?
- Did he/she reached the goals?
- Did he/she respected the timetable?
- Quality of images
- Quality of presentation

## Survey of need assessment and quality of education

As part of our educational strategy, we've developed a supplementary survey with the participants in 2016. It covered demographic topics and 4 specific questions regarding (1) quality expectations for CME programs, (2) AOSpine events highlights, (3) what could be improved in AOSpine events, and (4) activities of interest. Participants were asked to put each of the following topics in a priority ranking from 1 to 3 for the first 3 mentioned questions:

- Quality of scientific program
- Faculty quality

- Punctuality
- Academic freedom
- Organization and logistic
- Quality of support material
- Active participation of the audience

For the last question (activities of interest) the options to be ranked were:

- Live surgeries
- Seminars/Theoretical courses
- Practice in cadaver
- Virtual courses
- Live surgeries in animals
- Practice in plastic bones
- Clinical cases discussion

*Educational Advisors:* experienced faculty in education that one of the function is to evaluate the Faculty performance. He scores each Faculty in 4 different topics using the same five-point Likert scale, ending up in an average performance score. The following questions are scored:

- Quality of presentation
- Interaction towards discussions
- Timetable accuracy
- Language fluency (events may involve up to three different languages in Latin America)

# Results

This research covered 646 professionals and 7,962 evaluations in an 8-years window. It gave us an average of 12.3 evaluations per Faculty, who had from 1 to 280 evaluations each. In order to minimize variation, the different number of presentations were adjusted. Adjusted mean: 4.39 per faculty. 798 participants replied the 2016 survey from 20 countries of the region.

# Evaluation of Faculty performance

We’ve accessed scores from 646 professionals ($n$ = 646) in 7,962 evaluations from 2008 to 2016 using a five-point Likert scale. (Fig.02)

- The evaluation for a national Faculty was 4.42 points, the regional 4.56, and for the international faculty 4.53.

- The regional faculty had the best performance.
- There were statistical differences between the different types of faculties.
- A better evaluation was observed over the years independently of the type of faculty.
- A performance improvement is observed over the years, regardless the type of faculty

## Evaluation of course levels

- The mean punctuation from 0 to 5 for the master course was 4.25, for advanced 4.44, and the value of 4.48 for principles. (Fig.03)
- A statistical difference was observed between values with small magnitudes.
- Over time, the evaluations improved statistically at the 3 levels: principles, advanced and master.
- The performance had the same contribution for the year, course level and type of faculty. There was a tendency for the variables of years and level of the course to have the greatest impact.

## Evaluation of Chairperson's impact

- There is a poor correlation between the evaluation of performance by the participants and the Education Adviser ($r = 0.13$). (Fig.04)
- The Chair Training promoted an increase of the evaluation from 4.44 to 4.52 ($p = 0.022$).

## 2016 survey summary

## CME programs

- The quality of scientific programs was pointed as the first priority when choosing a CME program ($n = 430$). (Fig.05)
- The quality of faculty was pointed as the second top priority when choosing a CME program ($n = 229$).
- Scientific programs quality ($n = 723$) and quality of faculty ($n = 645$) outscored the remained options when consolidating the 3 levels of priority

## AOSpine educational events

- The faculty quality was pointed as the first priority when choosing an AOSpine educational event ($n = 320$). (Fig.06)
- The quality of scientific programs was pointed as the second top priority when choosing an AOSpine educational event ($n = 266$).

- Scientific programs quality (n = 651) and quality of faculty (n = 577) outscored the remained options when consolidating the 3 levels of priority

## AOSpine improvements

- The quality of scientific program (n = 165) and the active participation of the audience (n = 162) both scored as the top issue to be improved in AOSpine educational events. (Fig.07)
- Quality of support material scored as the third top issue (n = 127).
- Faculty quality (n = 117) and academic freedom (n = 116) appeared as the fourth top issue to be improved.

## Discussion

The faculties who were trained had a sustainable and higher score on the Faculty performance, regardless the type of meeting and the experience and type of Faculty. The quality of faculty reflects on a better quality of the scientific program designed. Both variables, faculty performance and quality of the events, are directly related to higher motivation and satisfaction of the participants.

An 18-years systematic review of a faculty development program at Duke University[8]demonstrated that helping the faculty to develop on a focused career plan was likely the most effective means of helping them to establish a solid academic record. Their goals were based on the idea that a rigorous process providing early “mentorship” would help the faculty better identify potential opportunities that might be otherwise missed, develop a better strategic plan for growth, and clarify goals. The 8-years systematic review of our Faculty Development Program reached similar outcomes. Moreover, it also reinforces the career path proposed by this program.

Most of the reviews on Faculty Development Programs cite and embrace a set of specific program design features that define high-quality programs. These features came from a framework designed by Desimone (2009) defining important aspects of FD. (Fig.08)

The model represents interactive, non-recursive relationships between the critical features of faculty development, teacher knowledge and beliefs, classroom practice, and student outcomes. As reflected in the figure, a core theory of action for professional development would likely follow these steps:

1. Teachers experience effective professional development.
2. The professional development increases teachers’ knowledge and skills and/or changes their attitudes and beliefs.
3. Teachers use their new knowledge and skills, attitudes, and beliefs to improve the content of their instruction or their approach to pedagogy, or both.
4. The instructional changes foster increased student learning. 9

As shown on this research systematic review, the proposed Faculty Development Program follow similar steps, therefore achieving very conclusive outcomes.

## Efficacy of FEP

The efficacy of our FEP program hold a positive result. The systematic 8-years evaluation showed a significant difference between the performance of Regional and International Faculty (trained professionals) and National Faculty (not all trained). In the other hand, the expertise level may be a confounding factor, since more experimented surgeons hold more strategic positions. Furthermore, the best performance of Regional Faculty overall may be a joint outcome of this issue together with the language barrier issue, since International Faculty usually doesn't speaks any of the Latin languages.

Despite this, the participants ranked Faculty quality and Quality of scientific program as the top two priorities when choosing an AOSpine educational event in the 2016 survey. This is a direct outcome of the Faculty Development Program and the strategies related to it.

## Efficacy of CEP

Events led by trained Chairpersons also had an increase on the evaluations comparing to those who did not had.

## Study limitations

Another finding of the 2016 survey ranked the quality of scientific program in second (third overall) and faculty quality in forth position when showing points to improve. In first instance, it may seem paradoxical, since both ranked on the top of priorities when choosing an AOSpine event. This might be due to the huge difference level between countries in the region, or even a problem regarding the understanding of the question itself. In any instance, this might show that the Faculty Development Program has a lower impact in the scientific program itself and it may be a point to develop. Both topics, together with the improvement of the participant's interaction, points towards improvements and possible future researches regarding our programs and activities.

## Future perspectives

Current research on teacher preparation includes relatively few studies that connect aspects of teacher preparation to students' learning. (…) In contrast, most current studies that pursue questions about teacher candidates' learning more or less ignore the issue of students' learning. Underlying these studies is an assumption that is especially relevant to this discussion: teacher learning is a necessary condition for student learning, thus teacher learning is a legitimate and worthy enterprise in and of itself. [10]

Considering our findings and the statement above, a next step of this study would be evaluate the need of a continuing assessment of the students in order to better understand their needs, therefore improving the educational outcomes.

## Conclusion

The appliance of a Faculty Development Program based on educational strategies directly affects the outcomes of educational events. The 8-years systematic review showed continued improvement of the trained faculty evaluations in all levels. This is due to the structured educational path together with the key aspects of the AO's educational strategy of a clearly defined educational plan, facilitated by assessment, supported by relevant resources, and driven by faculty development.

## List Of Abbreviations

CME: continuing medical education

FD: faculty development

FEP: faculty educational program

CEP: chairperson educational program

## Declarations

## Ethics approval and consent to participate

The present research do not need approval by the Ethic committee according to national regulations.

## Consent to participate

All participants voluntarily and anonymous completed the assessment questionnaires.

## Consent for publication

All authors gave their written consent for this publication.

## Availability of data and material

Not applicable

## Competing interests

Not applicable

## Funding

None of the authors receive any fundings for this paper

## Author's contribution

A.F and J. E. conceived of the presented idea. A.F and A. G. wrote the manuscript with support from J.E and D. M. All authors provided critical feedback and helped shape the research, analysis and manuscript.

## Acknowledgments

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# Figures

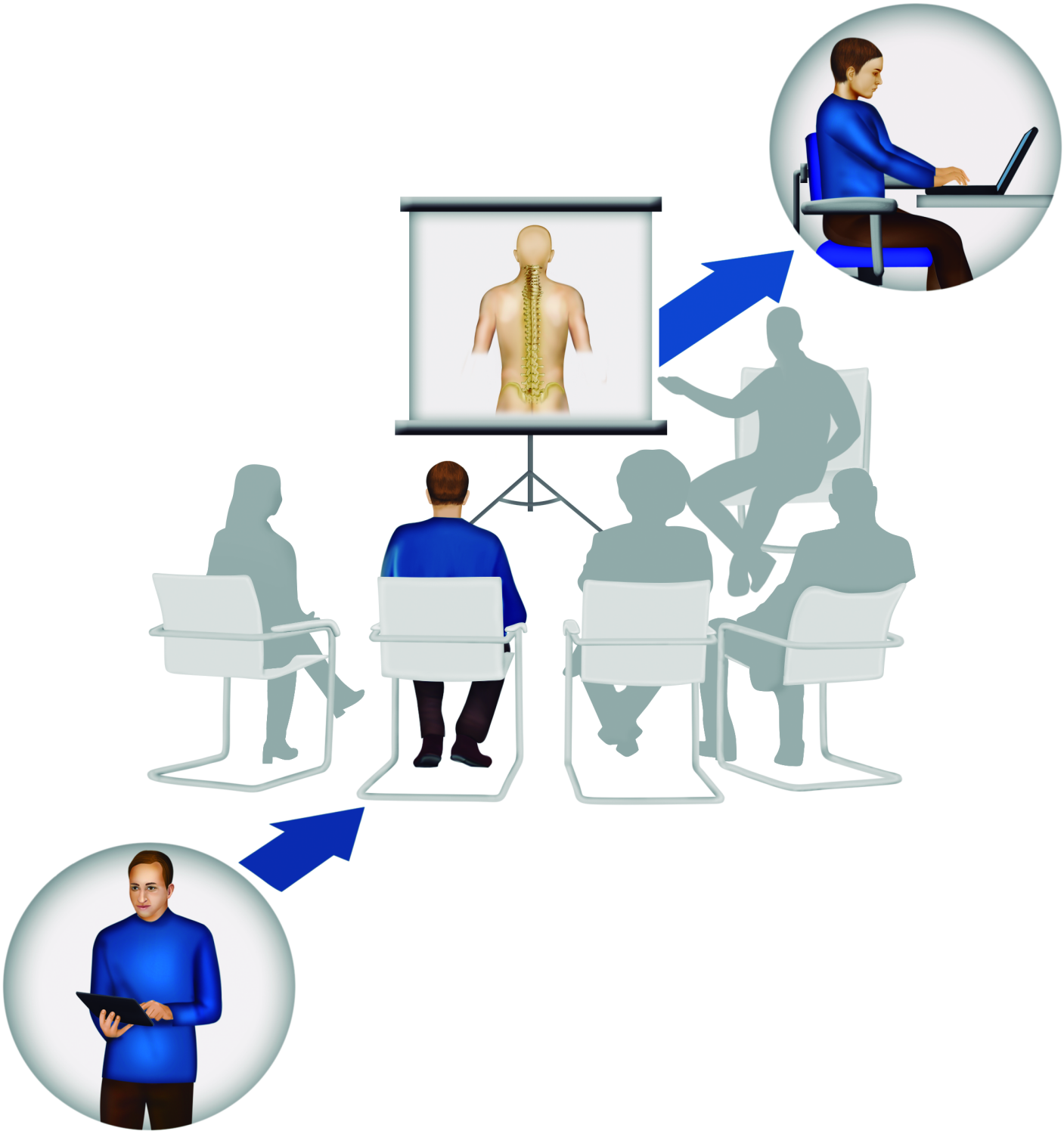

**Figure 1**

Blended learning structure

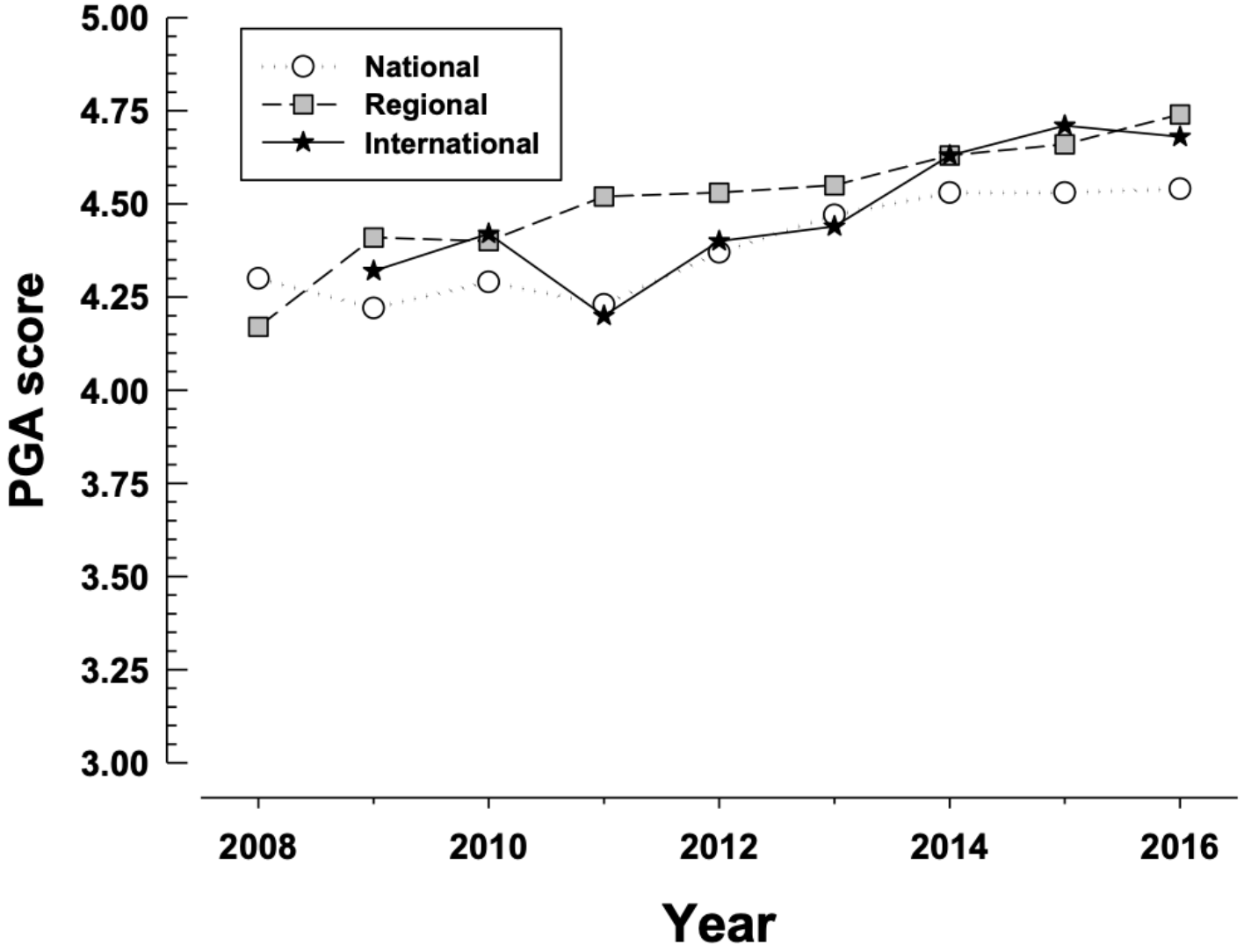


**Figure 2**

Scores from 646 professionals (n=646) in 7,962 evaluations from 2008 to 2016 using a five-point Likert scale.

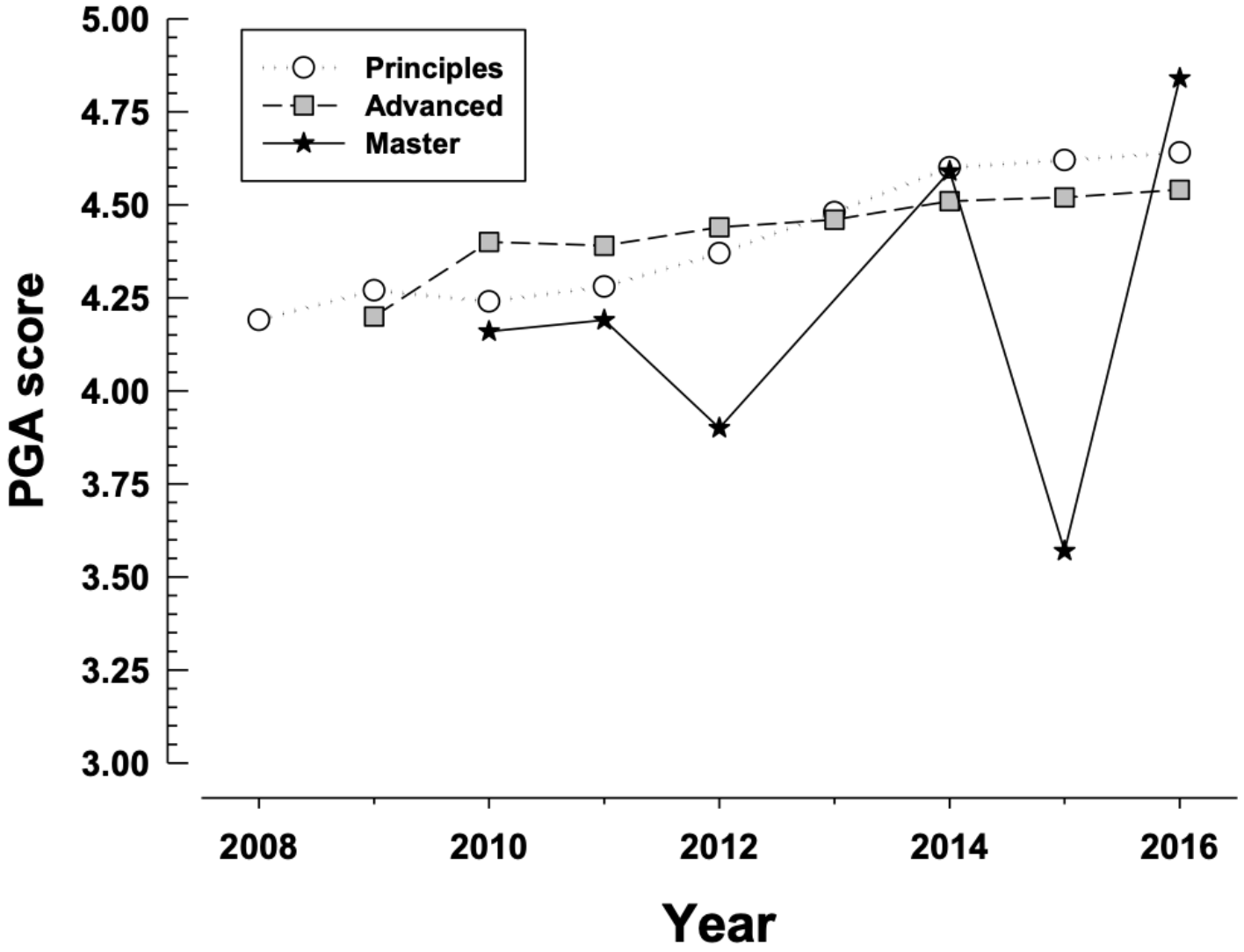


**Figure 3**

The mean punctuation from 0 to 5 for the master course was 4.25, for advanced 4.44, and the value of 4.48 for principles.

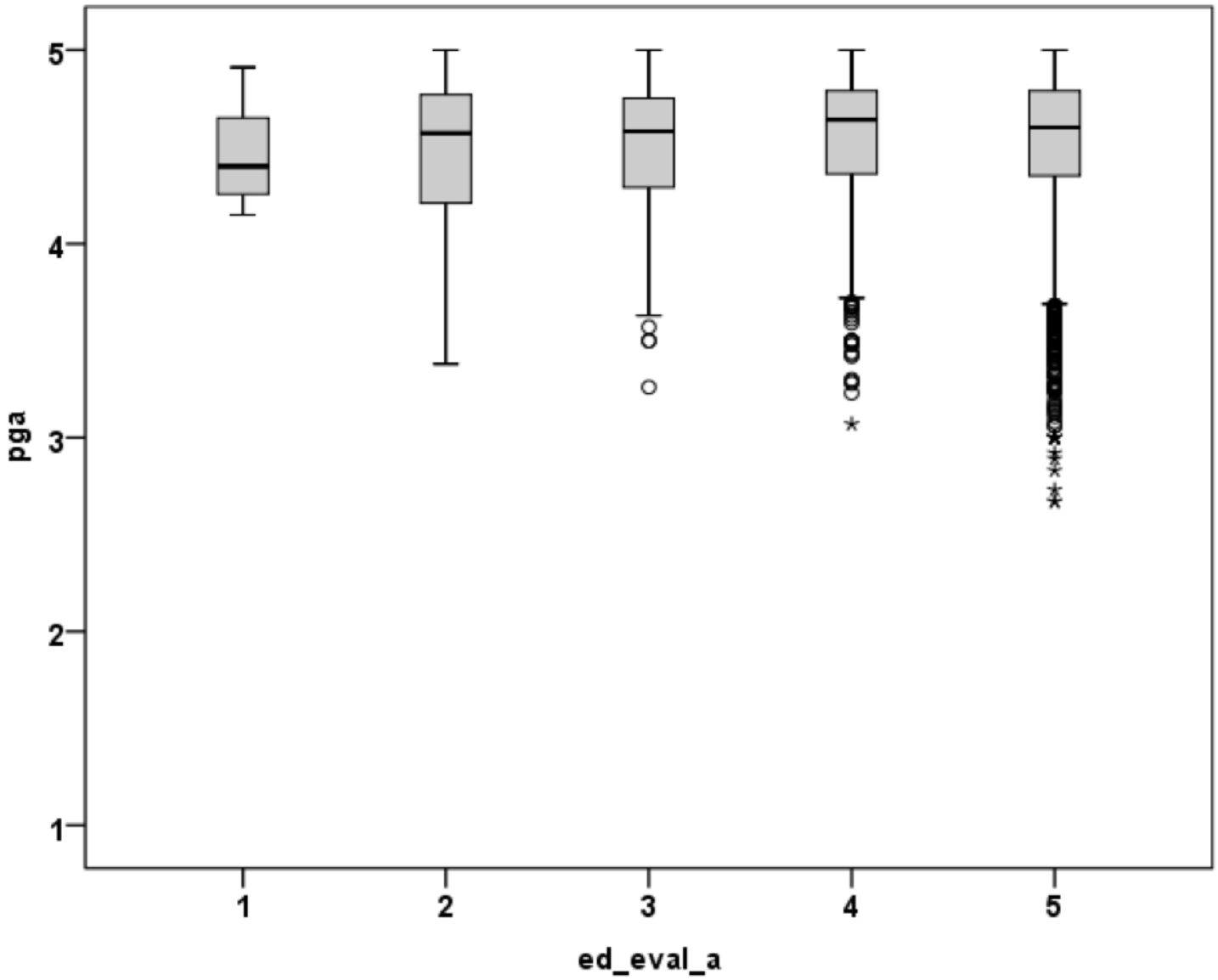


**Figure 4**

There is a poor correlation between the evaluation of performance by the participants and the Education Adviser (r = 0.13).

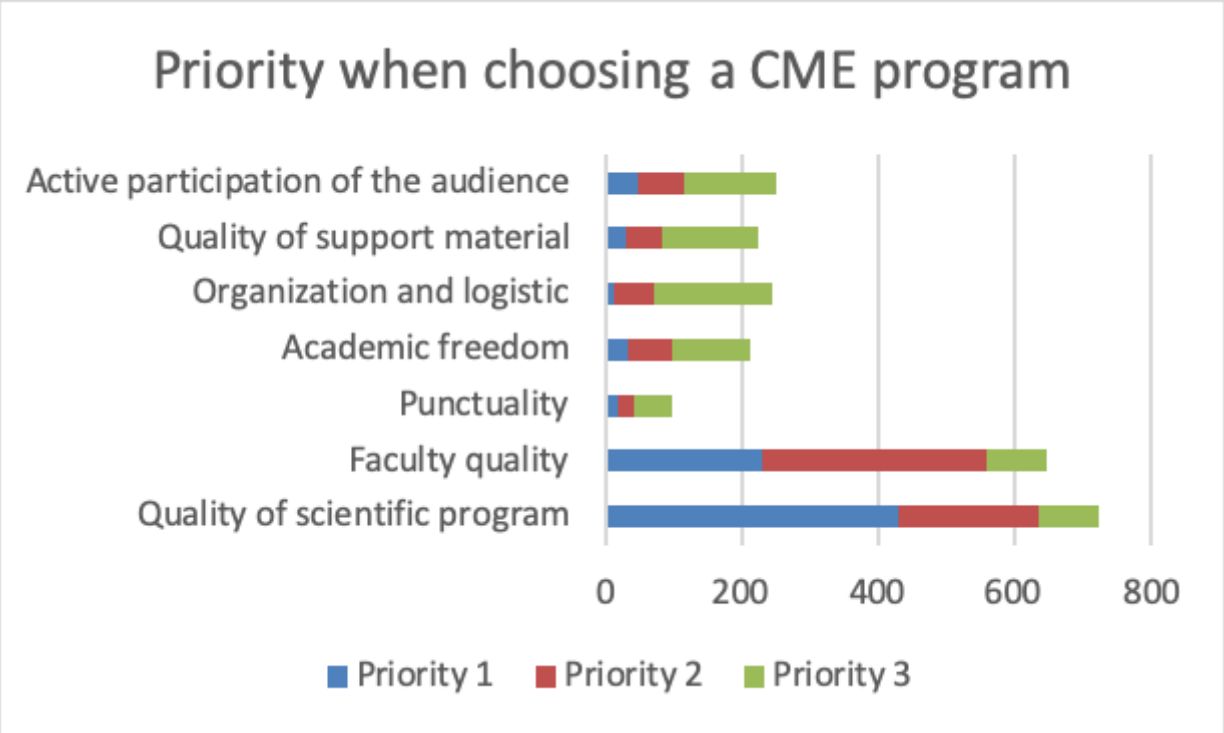


**Figure 5**

The quality of scientific programs was pointed as the first priority when choosing a CME program (n=430).

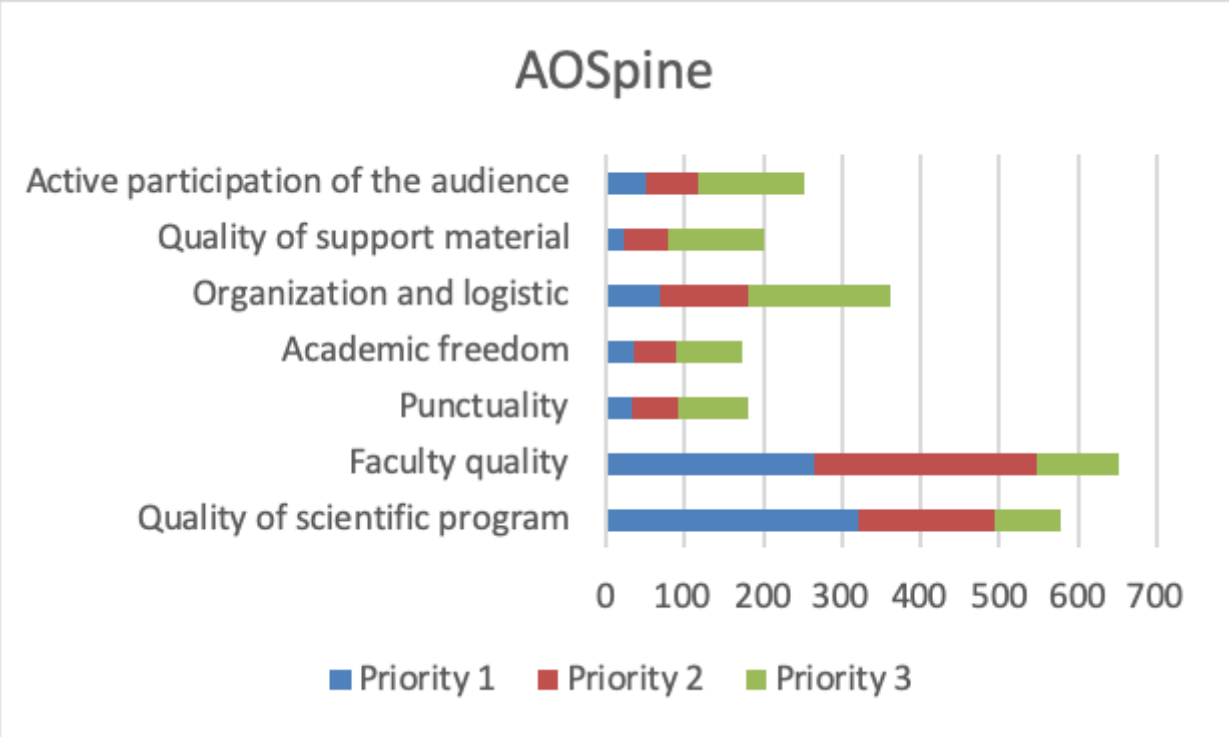


**Figure 6**

The faculty quality was pointed as the first priority when choosing an AOSpine educational event (n=320).

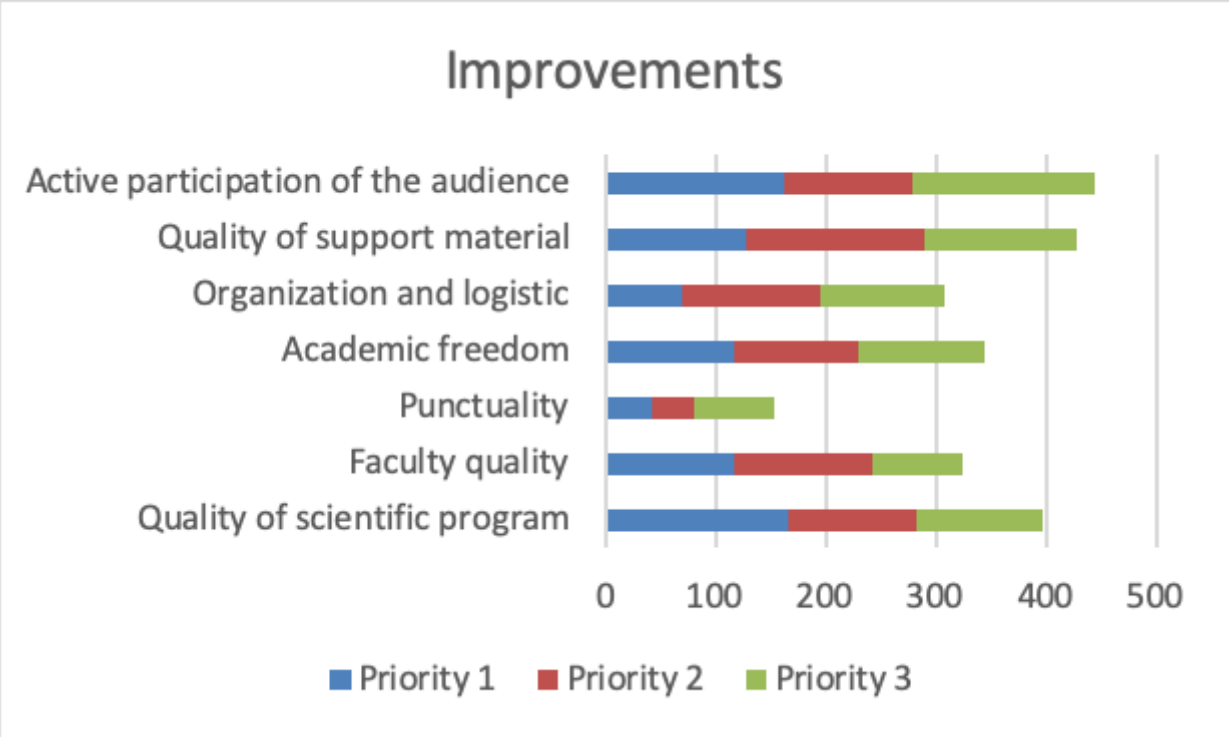


**Figure 7**

The quality of scientific program (n=165) and the active participation of the audience (n=162) both scored as the top issue to be improved in AOSpine educational events.

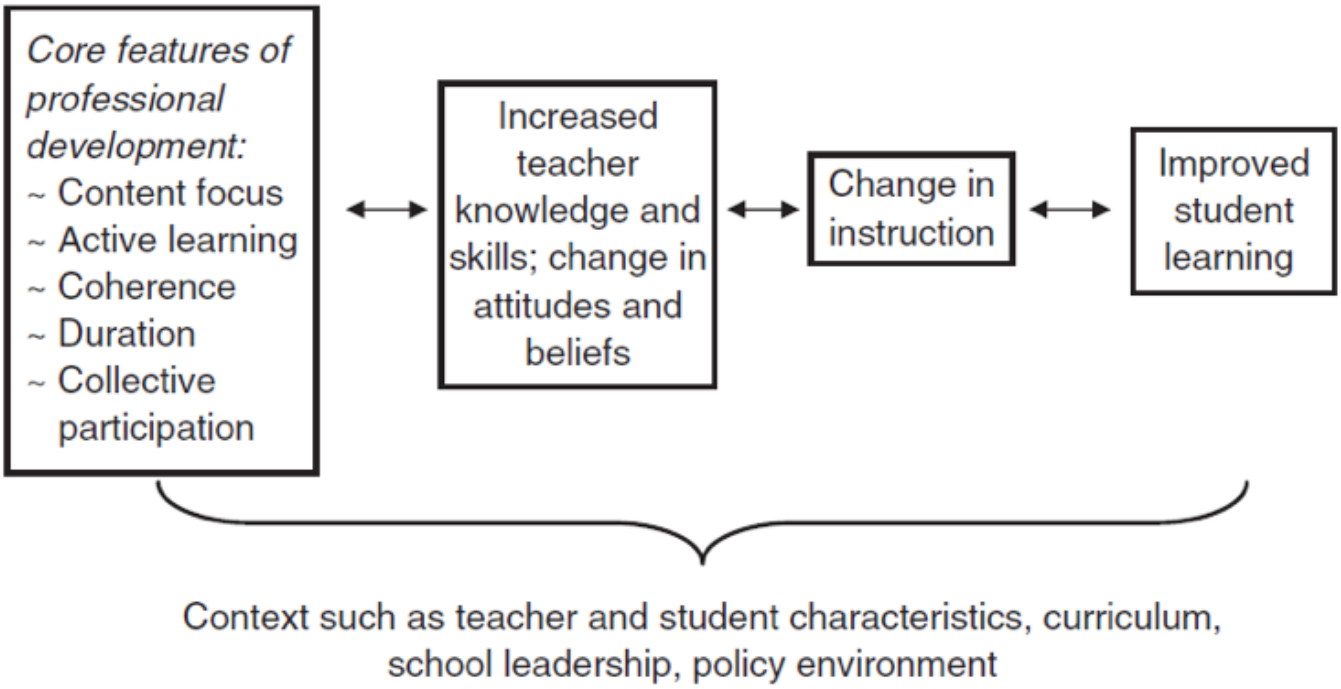


**Figure 8**

Proposed core conceptual framework for studying the effects of faculty development on teachers and students.