

How a Sabbatical can be used to Improve Course(s) Instruction

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Abstract

Most universities offer sabbatical leave to faculty for various purposes that range from pursuing in-depth research projects to updating professional knowledge. This paper will investigate the “who, why, and when” a sabbatical is applicable. Suggestions will also be given on selecting an appropriate sabbatical topic that will improve course instruction. An example of this author’s sabbatical content used to improve student instruction is included.

Introduction

The University of Arkansas – Fort Smith (UAFS) is an open admission institution with strong ties to local industry; it supports many technology related programs. UAFS in conjunction with the University of Arkansas - Fayetteville (UAF) offers bachelor degrees in Electrical and Mechanical Engineering. The Fort Smith campus is responsible for the first two years of the degree and additional interactions with senior design students. In this arrangement, UAFS faculty members predominantly teach freshman and sophomore courses which can bring the trappings of monotony and deterioration of instructor’s cutting edge knowledge. To help combat this issue, a sabbatical leave can be used to keep one’s knowledge up to date and bring new perspective to the classroom for both the instructor and student learners.

A sabbatical program is offered at UAFS; a short excerpt from the faculty handbook is given below on the rationale as background information.

“Sabbatical leave is recognized as a means by which faculty may pursue activities which will result in professional growth and development. Because scholarly and creative endeavors are essential complements to excellence in teaching, the University encourages and supports such efforts on the part of both its faculty and its students. Such activities include research, scholarly writing, artistic projects, professional travel, improving teaching skills or other professional experiences which will enhance professional skills and abilities that allow a faculty member to more effectively address the goals and mission of the University”.

In this paper a sabbatical leave policy survey of twelve (12) universities that commonly participate in the ASEE Midwest Section Conference was completed. Sabbatical leaves are alternately referred to as “Off-Campus Duty Assignments” and “Faculty Development Leave” as discovered in this cohort study. Generalized comments are given in this section pertaining to sabbatical leave of the 12 cohort universities; subtle differences will be omitted for simplicity. A listing of the 12 institutions surveyed is given in Table 1 below.

Table 1. This is a list of cohort universities used in sabbatical survey

Arkansas Tech University	Pittsburg State University
Kansas University	University of Arkansas - Fayetteville
Kansas State University	University of Arkansas – Fort Smith
Missouri State University	University of Missouri S&T
Tulsa University	University of Nebraska
Oklahoma State University	University of Oklahoma

Any full-time faculty member may apply for sabbatical leave after completing 12 semesters of full-time service to the university. Depending on the type of sabbatical requested, the faculty member may choose one semester leave with full compensation or two semesters with 50% compensation. Most universities require a concise proposal and other accompanying documents that support the application for sabbatical. Additionally, most surveyed universities require a written summative report and/or a formal presentation of accomplished work.

This paper will now address who, why, and when a sabbatical is applicable. Insight into the preparatory process of arranging a sabbatical will be discussed. The main emphasis of this paper on sabbatical content is related to benefits for students and the university.

Who, Why, and When a Sabbatical should be Taken

It is recognized in this cohort of universities that sometime during a faculty's academic career a sabbatical leave should be taken for professional growth and new or renewed intellectual achievements through study, research, writing, or training ¹. Motivation for taking a sabbatical leave is provided below.

Who should apply for a Sabbatical? All faculty members should consider applying for a sabbatical to prevent loss of cutting edge updates in their field for those in technical areas or loss of understanding regarding how their field of expertise is changing over time as in those areas that are less technically focused. Engineering is a demanding, technical profession that changes rapidly; all faculty members should seriously consider a sabbatical leave ^{2,3,4}.

Why should one apply for a Sabbatical? As an engineering faculty member's career moves away from their academic training and/or industrial experience, their knowledge base ages becoming less relevant to current technologies being used. This results in a negative impact on student education. Technical knowledge has a shelf life of approximately 5 years; therefore a faculty member should consider a sabbatical leave within this time frame. Feedback from industrial advisory boards constantly support the notion that faculty members need to stay current and be willing to add new curriculum to their degree plans which reflect these changes. In a normal academic year, there is little time for adding new knowledge to courses or updating technical skills. This in itself provides clear evidence sabbaticals are needed and helpful in meeting expectations of employers who hire university graduates. Being involved with the same activities/teaching load repetitively leads to fatigue; a sabbatical leave will help combat this issue which ultimately benefits the university and students.

When should a faculty apply for a sabbatical leave? Most universities surveyed allow a sabbatical leave after six years of full-time service or completing tenure. Any subsequent sabbatical leaves can be taken after a six year period. It is unclear from the author's research how the six year standard was selected. The obvious reasons include out-dated knowledge, diminished interest in current course material, diminished interest in working with students, and a strong desire to research and learn new things.

Recommendations Regarding Applying for Sabbatical Leave

If the answers to the questions discussed in the previous sections are supportive of a sabbatical leave decision, then it is time to start the application process. There are three things to consider when applying for sabbatical. (1) Project selection, (2) length of sabbatical, and (3) effects of a sabbatical leave benefitting the university and students.

Initially, project selection is critical for completing a successful sabbatical leave. Make sure to select a sabbatical research project that is interesting, challenging, meets university initiatives, and will benefit student education. The first issue to address is regarding appropriate funding/support; is it available? Funding usually comes from university budgets or grant monies. Be sure to receive commitments of these resources before applying for sabbatical leave. A discussion with the college Dean will be helpful with this issue. The second task is to ascertain if the sabbatical leave will require travel or a temporary move. This may have an impact on family or other professional commitments. The author recommends involvement of industry in the area of sabbatical research. Be sure to secure letters of commitment from companies involved and submit them with the sabbatical leave application.

Secondly, length of sabbatical leave is another question that must be determined before applying. Cohort institutions surveyed offer two sabbatical leave options: one semester / 6 month leave with full pay or two semesters/12 month leave with 50% pay. When selecting a sabbatical length option, consider project complexity and time requirements, departmental impact, financial needs, and family discomfort. If a temporary move is required, a decision for a one semester leave may need to be revisited as the effective working time of the sabbatical is reduced.

Thirdly, one must consider how a sabbatical leave will benefit the university and students. Many of the cohort universities allow sabbatical leave for research, additional training, and writing. A successful sabbatical application will link leave objectives to impacts upon the university. The author recommends making a clear connection between sabbatical work, changes in curriculum, and production of scholarly publications that can be universally adopted. An estimate of the number of courses and students that will be impacted from tangible and intangible skills gained during sabbatical leave will strengthen the application. Consideration of current technological trends and local/state industries has a significant bearing on how beneficial the sabbatical leave is to the university and students by enhancing their employment options.

The Author's Sabbatical Experience

As a note of reference, the author has academic/technical training in optics and semiconductor processing. These two industries do not have a presence in the Fort Smith region; therefore, a search for a research project that better supported the local industrial base

began. The Fort Smith region does have a strong industrial base in the areas of electric motors and drives, air conditioning equipment, appliances, and plastic molding and injection. After carefully considering this information, the author began a research project in 2006 to build a 5 passenger electric vehicle (car). There are 3 reasons this project was selected: (1) the ability to interact with local industries, (2) support provided by local industries, and (3) to increase the author's knowledge base of technologies related to local industries. All these reasons greatly improve the author's ability to interface with local industry and improve his knowledge base which then can be passed on the students.

The Electric Vehicle Project (EVP) began as an "Introduction to Engineering" class project in 2006 and resulted in the construction of an electric golf cart. Over the next three years a 5 passenger vehicle was constructed and tested based on a 1991 GEO Metro. This phase of the project involved 55 students at various levels. This first generation Electric Vehicle (EV) had several limitations due to funding and out-dated battery technologies; these limitations provided impetus to design and build a second generation EV. The design of the second generation EV started in 2010; this new design included using prismatic Lithium Ion (LI) batteries, a customized traction motor, and a 5-speed manual transmission. As can be seen from the given information, the EVP meshes well with the strength of local industries.

The author began the sabbatical leave application process in January 2011; this necessitated discussions with the engineering department head and college dean regarding support and teaching load impact. Also, support from local industries was pursued; this resulted in commitments from ABB Baldor and Rheem/Ruud. ABB Baldor committed to motor design/construction, drive hardware/software, office space, and access to testing facilities. Rheem/Ruud committed to fabrication of specialized parts needed to mate the electric motor to a 5-speed manual transmission. Letters of support from these local companies were included with the sabbatical application as a foundation for stronger ties between these companies and the university as well as mating the local companies' needs with the graduates produced locally by the institution.

The author's sabbatical leave application was strengthened by showing a direct link between knowledge and skills gained during the leave and their impact on course instruction and creation. For example, knowledge gained on motor design is incorporated into courses such as "Energy Conversion" and "Senior Design" which results in better trained students seeking employment in this local industry.

Table 2 below shows a list of knowledge/skills gained during the author's fall 2011 sabbatical leave. This table also shows courses, new and old, where gained knowledge/skills have/will impact course instruction.

Table 2.: This table lists knowledge/skills gained during fall 2011 sabbatical leave and courses they have/will impact.

Knowledge/Skills	Course Impact
Motor Design	Energy Conversion and Senior Design
Motor Drive Design	Drives, Energy Conversions, Power Electronics, Senior Design
Controller Area Network (CAN)	Digital Systems, Computer Architecture, and Microprocessor
Battery Management	Energy Conversions, Power Electronics, and Senior Design
Microcontroller Design	Digital Systems, Microcontroller Applications

The first instruction of courses impacted by gained knowledge/skills is “Digital Systems” and “Computer Architecture. This author has added additional information to these courses regarding the applications of a controller Area Network (CAN). During summer 2012 the author is guiding 5 student research projects which are being funded by grant monies secured with the aid of the sabbatical leave. Three (3) of these research efforts are Senior Design projects directly related to sabbatical leave work. The first student research project involves designing an efficient 3-phase inverter used in a specialized vehicle motor drive. The second student research project entails safely implementing a LI battery pack in an electrical vehicle. The third student research project requires the design of a programmable DC motor speed controller. All three examples require knowledge/skills related to motor and drives; the sabbatical experience allowed the author to capably mentor these efforts.

Conclusion

As an instructor’s technical knowledge ages or there is a strong desire to pursue an in-depth research project, a sabbatical leave should be considered. If a well structured sabbatical leave plan is devised, the faculty member, university, and students will benefit immensely. When contemplating a sabbatical, consideration of local industry resources, university needs, technological changes, and internal or external support is necessary. When writing a sabbatical leave application, be sure to show the effect of planned work with emphasis on impact to curriculum and student skills resulting in more employment opportunities for the university graduates.

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Bibliographical information

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