Workshops That Work!: Building an Effective, Technology-Rich Faculty Development Program

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Abstract

To prepare preservice teachers for the technology-rich environment of today's schools, faculty involved with the preparation of teachers must model technology use in their own instruction. The purpose of this PT³-funded project was to design and implement a faculty development program focusing on the effective integration of technology into courses taken by teacher education students. The three-year project involved a series of workshops and guidance for faculty to assist them in modeling effective technology integration. The evolution of this professional development program incorporated nine elements: popular technology topics, hands-on learning, modeling, individualization, technology infusion, efficiency, mentoring, sharing, and motivation. It was found that well-designed faculty development workshops are effective in training teacher educators to create technology-rich university curriculum.

For the past decade, teacher education programs have been under fire for inadequately preparing educators for the demands of technology-rich learning environment found in PK–12 schools. The National Educational Technology Standards for Teachers developed by the International Society for Technology in Education (2002) recommended that all teachers acquire competencies in the personal and professional use of technology. These competencies should be addressed throughout the teacher education program, including academic courses taken by students within and outside the school of education. Faculty across the university are affected. Teacher educators campus-wide must model technology use to prepare prospective teachers to integrate technology into their own instruction (Carlson & Gooden, 1999).

A number of studies have found that the integration of technology into methods and curriculum courses is more effective in preparing preservice teachers to successfully use technology in their future classrooms than stand-alone technology courses (Moursund, 1999). However, the Office of Technology Assessment (1995) found that few teacher education programs had faculty who were modeling effective integration of technology into the college curriculum.

Although preservice teachers are commonly provided with instruction in basic technology skills and shown examples of their use, they are often not required to apply technology in their courses (National Council for Accreditation of Teacher Education, 1997). The same is true of university faculty who may possess software application skills but may not have skills in integrating this software into their curriculum. Bielefeldt (2001) found that a quality professional development program is an important attribute of teacher education institutions that successfully integrate information technology.

Faculty Development and Teacher Education

Teacher education programs have sought ways to assist university faculty in modeling technology use and integrating technology into their academic programs (Handler, 1993; Munday, Windham, & Stamper, 1991). Faculty workshops are one of the most common professional development methods. However, questions have been raised about the effectiveness of workshops in making significant changes in teaching practice (Fullan & Stiegelbauer, 1991). Chamberlin and Scot (2002) found that workshops yield sustainable change when they include appropriate needs analysis, content-based instructional strategies, and long-term planning for ongoing faculty professional development.

According to Sprague, Kopfman, and Dorsey (1998), faculty development should explore technology options, provide time to learn the technology, include examples of classroom applications, and allow opportunities to reflect on teaching practice. Darling-Hammond (1997) emphasized that it takes as many as 50 hours of instruction, practice, and coaching on implementing new teaching strategies before teachers become comfortable using those strategies in their classrooms. These findings indicate that an ongoing commitment to professional development is essential.

The U.S. Department of Education's Preparing Tomorrow's Teachers to Use Technology (PT³) initiative was designed to improve technology integration in teacher education programs. The University of Toledo received a PT³ implementation grant titled Teachers Info-Port to Technology (TIPT). The purpose of the project was to design and implement a faculty development program focusing on the effective integration of technology into courses taken by teacher education students. The three-year project involved a series of workshops and guidance for faculty to assist them in modeling effective uses of technology. This article focuses on the evolution of this professional development program over three years. Recommendations from the professional literature related to professional development and technology integration were used to guide the revision of program materials. Table 1 provides a summary of the project year and design element addressed, author and publication date of professional literature used, and recommendations applied.

Year 1 Professional Development Program

During the Fall semester of 2001, surveys were distributed to all faculty members in the Colleges of Education and Arts & Sciences at The University of Toledo. The survey was designed to collect data about how faculty integrated technology in their courses. Specifically, information was gathered about the types of technology used by faculty, how often and to what extent faculty require students to use technology in the classroom, and whether faculty were interested in participating in workshops

Table 1. Major Recommendations of Literature on Professional Development Workshops

Year & Design Element	Author & Publication Year	Recommendations in Literature
Year 1		
* Popular Topics	ISTE Standards (2002)	Apply standards for teachers
* Popular Topics	Butler & Sellbom (2002)	Address common faculty technology proficiency areas
* Hands-on Approach	Chamberlin & Scot (2002)	Spend at least 50% of workshop time with hands-on Maximize time for practical product creation
* Modeling	Jonassen, Peck, & Wilson (1999)	Encourage learners to become actively involved as knowledge creators
Year 2		
* Overall	Marra, Howland, Wedman, & Diggs (2003)	Accommodate and scaffold technology learning for differing technology skill levels of faculty
* Individualization	Smith & O'Bannon (1999)	Use a combination of workshops and individualized mentoring
* Individualization	Zachariades & Roberts (1995)	Focus on the specific needs of faculty members
* Individualization	McKenzie (1999)	Show a connection between faculty work and technology tools
* Individualization	Chamberlin & Scot (2002)	Place instructional examples in context of participant's background and experiences
* Infusion	Holm & Horn (2003)	Employ effective teaching techniques in workshops
* Infusion	Chamberlin & Scot (2002)	Model technology twice with participants following along Provide tutorials and inquiry-based projects that allow participants to work at their own pace
* Efficiency	Strudler, McKinney, & Jones (1995)	Provide time savers to assist faculty in making good use of planning time
Year 3		
* Overall	Holm & Horn (2003)	Model professional learning communities
* Overall	Rogers (1995)	Encourage the actions of change agents
* Overall	Bielefeldt (2001)	Promote commitment to technology innovations
* Mentoring	Chuang, Thompson, & Schmidt (2003)	Use faculty mentoring programs to promote faculty technology integration
* Mentoring	Ali & Elmahdi (2001/2002)	Provide individualized support
* Sharing	Chizmar & Williams (2001)	Encourage faculty desire to interact and compare notes with peers
* Motivation	Butler & Sellbom (2002)	Promote the belief that technology enhances learning
* Motivation	Hagner (2000)	Build systems that provide positive experiences

to enhance their technology use and integration skills. It was found that other than word processing and e-mail, little technology was being used. However, faculty response to the opportunity to participate in the faculty development program was overwhelming.

Due to the high demand by faculty to attend the faculty development workshops, 31 faculty members were randomly selected for participation in the first year. Fifteen were chosen from Education and sixteen from Arts and Sciences. During the three-year program, a total of 91 faculty members were able to participate.

Faculty development workshops were based on research findings related to quality workshop practices. Butler and Sellbom (2002) found that reliability of the technology and knowledge of how to use the technology were the most common factors affecting adoption of technology by university faculty. As such, emphasis was placed on developing competence in technology use as well as troubleshooting common problems. For example, rather than simply teaching the use of PowerPoint for classroom presentations, the workshops modeled ways to develop effective presentations. In addition, discussions focused on the use of the data projector and common problems encountered in accessing technology in the classroom for conducting desktop presentations. Recommendations were also provided for making technology use more reliable campus-wide.

Year 1 Workshops

The first-year workshops focused on three areas: exploring popular technology topics, emphasizing hands-on learning, and modeling effective teaching strategies with technology.

Popular Topics. The professional development workshop topics were carefully selected. Based on the ISTE standards for teachers (2002), the interests of faculty identified through surveys, and the availability of campus technology, the workshops explored the most popular technology topics. Butler and Sellbom (2002) found that presentation software, graphics software, Web use, spreadsheet, e-mail, and word processing were the most common faculty proficiencies in technology. The Year 1 workshops focused on imaging, Web resources, spreadsheets, desktop presentations, distance learning tools, graphic organizers, electronic portfolios, and instructional design.

Hands-on Approach. Faculty need time to explore and learn to use technology. Chamberlin and Scot (2002) recommended that a hands-on approach focus on participants spending at least 50% of their workshop time applying their ideas to technology-rich instructional situations. The workshops were designed to maximize the amount of time spent on creating practical products that would be immediately useful in the classroom. For example, faculty learned to convert their syllabi and Web link lists developed in Microsoft Word to HTML format and upload them to their Web spaces.

Modeling. Quality teaching strategies and technology must be interwoven in teacher education. Faculty must model effective teaching practices as they integrate technology. Jonassen, Peck, and Wilson (1999) focused

on a constructivist approach to technology integration encouraging students to become actively involved as knowledge creators. For example, rather than simply teaching faculty to use Microsoft PowerPoint to make presentations, the workshops stressed using the tool to develop an active learning environment in the classroom. Participants learned to use visuals in PowerPoint to make their presentations more dynamic. They learned to develop reflective questions and build inquiry-based presentations.

Year 1 Results

At the end of Year 1, a survey was distributed to each participant. The survey contained five Likert-type questions related to the overall content and format of the workshop series. Next, participants rated the usefulness of each workshop session. An area was also provided for comments. Finally, they were asked to provide examples of how they planned to integrate technology into their classrooms.

Based on the participant evaluations, the first workshop series was an overwhelming success. All the workshop sessions and presenters were rated highly by participants, with the exception of the instructional design workshop. Faculty felt that they already had skills in this area and that the workshop did not add to their knowledge. As a result, this option was eliminated in Year 2. Of the 31 participants, 19 (61%) completed the participant evaluation survey. For a program of this size with the opportunity for close interaction with participants, this return rate was low. Participants were permitted to take the evaluation forms with them with the promise that they would be returned. This did not occur. Subsequently, all participant surveys were administered as part of a session in order to secure response rates closer to 100%.

Participants were asked about the usefulness of each workshop. The actual percentage responding that the workshop was very useful overall was 68% (13). No one responded that the workshop was ineffective.

Participants were asked if the workshop content was appropriate. Of the 19 respondents, 53% felt the content overall was "very appropriate," 26% felt it was "appropriate," and 16% felt it was "somewhat appropriate." One respondent did not feel the content overall was appropriate at all. Open-ended items in the survey indicated that this respondent felt the focus of several of the sessions was below what might be expected of university faculty and geared more towards what a K–12 teacher might expect to incorporate into their classrooms. The majority of faculty found the content overall to be "very appropriate."

Participants were asked if the amount of information provided was suited to the time and abilities of the faculty members. Results show that 53% of the respondents felt the amount of information was "just enough" and 26% felt it was actually "more than enough," suggesting that perhaps too much information was covered during the course of the workshop series.

Participants were asked to rate the usefulness of the specific topics covered in the TIPT workshops. The faculty found the Web-based course development and Web page design sessions particularly useful. They also indicated an interest in additional topics including chat rooms, e-mail lists, assessment tools, and video editing. Several felt the need for additional time to work on projects with the availability of immediate help. Many indicated they would like follow-up sessions or more time with some topics.

In general, faculty participants wanted more time to practice and some type of project or product on which to practice. In the next workshop series, more emphasis was placed on developing and following projects from start to finish and actively working on course materials during the workshops. Subsequently, faculty participants were asked to select a specific course they could use as an example throughout the workshop series. They were also required to produce frequent samples of their progress, just as they would from their students. These samples were then used for formative feedback and allowed individual attention to different skill levels. In addition, fewer topics were explored to provide additional time for creating and applying new technology skills. Finally, subsequent workshops incorporated Web site resources with training materials, templates, and other support materials to increase the efficiency of faculty in designing and producing instructional materials.

The workshop evaluation survey also asked faculty to provide two examples of ways in which they planned to integrate the technology tools and skills attained during the workshop series. Of the 19 respondents, only one did not plan to integrate technology into some aspect of a university course. The reason for not doing so hinged on the unavailability of hardware, software, and technical support. Six of the remaining 18 planned to use technology to enhance planning and record keeping in their courses. The rest of the faculty (12) provided examples of the integration of technology into the classroom that involved both faculty and student use of technology.

Overall, the first workshop series was a success as reflected by the workshop evaluations. However, the true test will occur over time as faculty evidence of effective integrating of technology is demonstrated.

Prior to the workshops, course syllabi reflected little technology use. Faculty members were asked to submit syllabi for the semester following the professional development activities to determine if any evidence of technology integration was demonstrated. Twenty syllabi were examined to determine whether they reflected integration of technology into their courses. Syllabi were rated in two general areas: (1) the faculty member uses and models it and, (2) students themselves are required to use it. Each faculty or student use of technology was given one point. In addition, technology integration activities based on specific, research-based educational strategies were given two points. The use of word processing was not included as it already played a prominent role in the university classroom prior to the professional development workshops. Scores could range from 0 to more than 30.

The study of syllabi found all faculty incorporated at least a minimal level (1–7 points) of technology. In addition, 12 (60%) of the respondents incorporated the use of technology into their course instruction at an adequate level (8–14 points). It is expected that continued professional development, along with the sharing of ideas and strategies among faculty members will increase this number. The tools most commonly used by faculty were e-mail (17) and the use of the Internet for research (11). For example, professors of education, English, geography, foreign language, and history found Web resources that could be incorporated into classroom assignments. Student use paralleled faculty use, with 16 courses requiring students to use e-mail and 10 requiring students to research on the Web. A math professor required students to use a Web site simulation to collect data for analysis. Although the most common uses were still the more traditional tools (e-mail and Web), many participants reported using technology in creative ways to enhance the teaching/learning experience. For instance, special education faculty found short, digitized video clips as an effective tool for helping students observe particular behaviors that would be difficult in a classroom setting. A history professor is helping students understand the culture of Japan by developing virtual field trips using photographs from recent study tours.

Of the 30 faculty participants, 20 have returned syllabi to date and five indicated that they were either not currently teaching the courses they had adapted or they were away on sabbatical. Syllabi from the remaining five participants are still being solicited.

Year 2 Professional Development Program

A goal of the second year was to focus on faculty content areas. The TIPT project developers explored ways to make the program more individualized and efficient in terms of content and activities. The TLC (Technol-

ogy Learning Cycle) states that faculty development programs should be more concerned with the process of learning technology than with a set of specific technologies. The five phases of the cycle are awareness of technology, exploration and filtration, learning, application, and sharing and reflection (Marra, Howland, Wedman, & Diggs, 2003). The model suggests that workshops should accommodate and scaffold technology learning for differing technology skill levels of faculty. This need to address the individual needs of faculty was revealed in the workshop evaluations from the first year, indicating that faculty wanted more examples directly related to their content areas.

Year 2 Workshops

The second-year workshops focused on three areas: individualizing workshops to meet faculty needs, infusing technology in meaningful ways in specific content areas, and providing efficient, practical activities to facilitate learning and reduce training time.

Individualization. A combination of workshops and individualized mentoring activities was found to be effective in supporting faculty use of technology (Smith & O'Bannon, 1999). Zachariades and Roberts (1995) suggested an individualized professional development approach focusing on the specific needs of faculty members. For example, McKenzie (1999) found that teachers are more likely to embrace technology if they see a connection between their work and the technology tools. According to Chamberlin and Scot (2002), workshop planners should conduct a needs analysis to determine and address participant needs. They also recommended that instructional examples be placed in the context of each participant's background and experiences. When planning workshops for Year 2, emphasis was placed on addressing content-area and technology needs and interests of each individual faculty participant.

Infusion. To employ effective teaching techniques, teachers need to experience them in their own learning and rehearse them with others (Holm & Horn, 2003). Chamberlin and Scot (2002) stated that technology modeled twice with participants following along is the ideal situation for workshop learning. They also recommend providing tutorials and inquiry-based projects that allow participants to work at their own pace. Year 2 workshops placed emphasis on modeling effective uses of technology and embedding practical, simple activities that required participants to brainstorm ways these techniques would apply to specific teaching situations. These inquiry-based activities were designed to promote realistic projects and facilitate faculty follow-through. For example, Inspiration concept-mapping software was used for brainstorming classroom technology integration ideas. Faculty members then developed an example they could use in one of their classes.

Efficiency. Time is a primary concern of faculty members and is often provided as a reason for not using technology in the classroom (Strudler, McKinney, & Jones, 1995). Year two focused on providing time savers to assist faculty in making best use of planning time. For example, Web page templates were provided for developing online versions of course syllabi, vita, activities, and assessments. University logos and content-area clipart and photographs reduced the time spent seeking copyright-free visuals. Sample PowerPoint presentations were provided that could easily be adapted for specific content-area needs. The TIPT Web site (http://tipt3.utoledo.edu/) provided subject-area resources, templates, and other resources to help faculty use technology more efficiently.

Year 2 Results

The same survey used at the end of Year 1 was distributed to each participant at the completion of Year 2. Of the 30 faculty members participating in Year 2 activities, 26 completed the professional development evaluation form. Faculty found the workshop activities to be useful and the content to be appropriate. Twenty-five of the 26 respondents found the workshops to be useful (9) or very useful (15). They found the content to be appropriate (11) or very appropriate (12). Faculty were split however, as to the amount of content covered. Six of the 26 respondents wanted more content and nine felt too much content was covered. This disparity was likely due to the varying levels of technology skills among the participants. As such, workshop revisions were made to assure that individual differences are more adequately addressed. Although the workshop participants were provided with activities and examples to fit their individual levels, some faculty may have felt overwhelmed by the choices. Most felt the length of the individual sessions to be adequate, but eight of the 25 respondents (31%) felt the workshop should have been longer. Faculty found the imaging, desktop presentation (i.e., PowerPoint), and Web development (i.e., Dreamweaver) workshops to be most useful.

Faculty were asked how the workshops helped in their teaching and to provide two examples of how they might integrate technology into their teaching. Of the 26 respondents, 20 provided two examples, one respondent provided only one example, and five respondents left the item blank. Most faculty provided good examples of technology integration. Rather than focusing on low-level activities such as searching the Internet and writing a paper, many assignments asked students to conduct e-mail interviews with professionals, document an experience using digital camera photos or digital video, or interpret primary resources found on the Web. An analysis of course syllabi confirmed the self-reported uses of technology.

Year 3 Professional Development Program

Building a climate of learning is essential in creating a dynamic, technology-rich teacher education program. Holm and Horn (2003) stated that teacher education programs should be models of professional learning communities that foster and nurture professional dialogue and collaboration. Rogers (1995) suggested in his analysis of diffusion of innovations that the actions of change agents are important in reaching a critical mass of adopters. Bielefeldt (2001) found that one of the drivers of technology use was commitment to technology innovations. The focus of Year 3 was creating a supportive environment where faculty share and collaborate across the campus. In addition to workshops similar to those offered during Year 2, ongoing support systems were established to assist faculty in enhancing their instructional programs with technology.

Year 3 Workshops

The third-year workshops focused on three areas: mentoring, sharing, and motivation. Faculty members were encouraged to work in pairs or small groups and share their experiences with other participants. In addition, faculty participants from the first two years were encouraged to share their projects and ideas.

Mentoring. Many studies have found that faculty technology mentoring programs are effective in promoting faculty integration of technology (Ali & Elmahdi, 2001/2002; Chuang, Thompson, & Schmidt, 2003). As faculty become increasingly technology literate, the emphasis of workshops shifts from a focus on the technology to an emphasis on refining teaching strategies. During the final year of the project, first- and second-year project participants were encouraged to team with faculty entering their first year. It was hoped that these faculty mentors would share their experiences, and this interaction would encourage collaboration among departments and faculty members across campus. These mentoring relationships seemed to work best in departments where a different faculty member participated each year of the project. Faculty members teaching different languages came together to discuss ways in which they were using technology.

Sharing. As an increasing number of faculty have become involved with technology integration, more quality examples are available. According to Chizmar and Williams (2001), faculty have a desire to interact and compare notes with peers on campus who are involved in instructional

Figure 1

technology at comparable levels. During the final year of the project, the Teachers Info-Port to Technology (TIPT) Web site highlighted specific strategies faculty are using to integrate technology into their classrooms. These examples were also shared and expanded through the workshops. For instance, two education professors participated in the Year 1 workshops. They spent the next two years exploring ways to incorporate digital photography into their physical education curriculum. They used photography to promote positive attitudes toward fitness and sports in preservice teachers and students. For example, teacher educators were asked to take on the role of sport journalists, feature article writers, or sports analysts, and use digital photographs as the focus of their stories. The faculty found that many of their preservice teachers began incorporating digital photography into their lesson plans and field experiences. Figures 1 and 2 show photographs that were taken by preservice teachers as they explored ways to use digital photography in the classroom.

Motivation. Convincing faculty that technology integration matters is the final challenge of this project. Hagner (2000) found that most universities provided no faculty incentives for incorporating learning technologies into their courses. However, Hagner also noted that faculty members like the student benefits and personal satisfaction that occurs with successive, innovative teaching. Systems must be established by institutions that provide opportunities for positive experiences with learning technologies.

Most faculty participants have enjoyed the workshops and successfully integrated technology into their curriculum. According to Butler and Sellbom (2002), belief that technology improves or enhances learning is the third most common element affecting adoption of technology. However, they found that many faculty are skeptical that technology facilitates learning in higher education. The final year of the project incorporated results of scientifically-based research and practical experience to demonstrate the positive effect of technology on teaching and learning at all levels.

Figure 2

Year 3 Results

At the completion of Year 3, a survey was distributed to participants. The questions were the same as previous years except for an additional question relating to their thinking about technology integration.

Twenty-four of the 30 faculty members participating in Year 3 completed the professional development evaluation form. Faculty members found the workshops and sharing experiences beneficial and inspiring. One participant stated, "I have overcome my fear of technology and now use technology with students." Another commented, "I have moved from thinking about technology as a supporting tool in my teaching to thinking about the integration of technology into who I am as a teacher." The only negative comments reflected lack of available hardware and software within specific departments.

Project participants were asked to identify those technologies they were integrating into their courses. The most common uses were Internet resources (19 of 24 respondents), PowerPoint use (18 of 24 respondents), and digital camera use (13 of 24 respondents). Many of the respondents who indicated they weren't using a particular technology (i.e., video cameras, Inspiration software) noted that a lack of access, not a lack of interest, was the cause.

Participants were also asked to provide examples of new ways they are integrating technology into their courses that they were not doing before the workshops. Rather than focusing on basic types of technology, many noted advanced applications such as the use of recorded audio and digital video in PowerPoint. They were also looking for the unique ways that technology could be used to enhance learning and assessment. For instance, a science professor now requires students to record their voice as part of an exam to check student pronunciation of scientific terms.

Faculty members were also asked to list one or two ways the professional development experience changed their thinking about the use of technology in teaching. Below are a few of their statements:

"Students need visuals to prompt learning and the labor of providing the visuals and managing the technology is worth the effort."

"Web resources are amazingly diverse for my field."

"Only use technology when it is appropriate to do so—no just because it's there."

"Technology is absolutely necessary and instrumental for effective instruction."

"I have discovered more ways to engage students and to make some of the ideas and theories I teach come alive to students."

"I used to think that I needed to write things on the board, impromptu, largely because what I wrote changed according to the needs of each class. Now I realize that PowerPoint/Inspiration-based diagrams can actually present the material more clearly and I can still put more examples on the board if needed. Additionally, I am struck by how much more 'seriously' students take a diagram projected from a computer (they seem to be taking more complete notes)."

"Technology is not as difficult as I perceived; it can be more than a substitute for face-to-face learning; it can be better or more effective in certain application."

These responses show a shift in attitudes toward the integration of technology into classroom instruction. Not only do the faculty participants feel more comfortable with technology tools, they are excited about the potential and recognize the effect of technology on the teaching and learning process.

Conclusion

The integration of technology and active learning strategies into the classroom increased dramatically during the past decade (Evans, 2002). It is essential that our teachers be prepared for the technology-rich environment of our schools. Kinslow, Newcombe, and Goss (2002) stressed that "the indoctrination of the new teaching force may best be done by higher education faculty members who walk the walk, not just talk the talk" (pp. 82).

The outcomes of this three-year project demonstrate that the creation and implementation of meaningful, practical professional development opportunities can positively affect the way faculty members use technology in teaching and learning. As a result of each year's experiences, the workshop planners incorporated new design elements intended to enhance the professional development learning experience.

Nine design elements were incorporated into the workshops during a three-year period. The first-year explored popular technology topics, emphasized hands-on learning, and modeled effective teaching strategies with technology. The second-year placed emphasis on individualizing workshops to meet faculty needs, infusing technology in meaningful ways in specific content areas, and providing efficient, practical activities to facilitate learning and reduce training time. The third-year workshops expanded the workshop activities to include mentoring, sharing, and motivation aspects.

The workshop planners found that by focusing on a few research-based enhancements each year, they were able to refine the instructional materials and strategies effectively and efficiently. As professional developers design learning opportunities, this literature-based approach is strongly suggested.

Well-designed faculty development workshops can be effective in training teacher educators to design technology-rich university curriculum. Evidence of the lasting impact of this project was found recently while collecting data for a university study related to NCATE (National Council for Accreditation of Teacher Education) accreditation. Faculty members were asked how technology was integrated into their curriculum. Examples of technology integration were found in all courses related to the teacher education program.

Note

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