

## **VIRTUAL INTERNSHIP PROGRAM: REVIEW OF FRAMEWORK**

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### **ABSTRACT**

Virtual modes of teaching and learning activities are the current norm. This include virtual internship as a participation of dynamic problem solution in professional working environment using remote placement training. The opportunity encourages interns to recognize and solve problems, comprehend new phenomena, and construct mental models of those phenomena. The paper addresses the concerns of lack of internship framework appropriate for remote environment. The paper review framework of similar studies in various discipline to highlight diverse issues to accommodate internship during this time of uncertainty. This study is based on a work in progress of review on available framework. The summary of the case serves as initial step to understand the challenges and strategies in virtual internships. Refined questions of pertinet issues to support virtual internship will be required in the next step of the study.

Keyword: virtual internship, undergraduate program, implementation model

### **1. INTRODUCTION**

The transition of COVID-19 the new phase of endemic open for another changes but virtual modes of teaching and learning activities continue to be the current norm. The circumstances of physical distancing and remote learning leads to virtual internship programme

takes place. The virtual internship involves participation in dynamic problem solution in professional working environment using remote placement training.

The pandemic brings a significant impact on internship implementation as decrease number of placements offered by industries (Koopman et al. 2021). Many employers also modify their office into a virtual operation environment. The progress require higher learning institution to make necessary changes and pay more attention to virtual internship (Briant & Crowther 2020; Teng et al. 2021).

Virtual internships are unlikely to disappear post-pandemic (Hora et al. 2021). Virtual internship requires an added layer of complexity for online positions with respect to information and communication technology. Issues such as network access, work-life boundaries, and challenges associated with virtual working environment (Hora et al. 2021).

Internships continue to play an important role in computer science and software engineering programmes to help students in a variety of. Among the key points include strengthening students' academic self-concept and increasing their persistence in the field ways (Koopman et al. 2021).

While literature exists on virtual internships, relatively little exists on software engineering virtual internships (Koopman et al. 2021). Internship framework offers a structured approach to implement internships, including elements on remote work and digital learning (Hora et al. 2021).

The review of literature on virtual internships across disciplines to find effective practices that can be applied to virtual software engineering internships. This paper provides review of virtual intership framework across various domain. The review sets the stage by a brief summary of research including on traditional internships and

management of virtual teams before investigating into findings on the opportunities and limitations as well as program design recommendations for virtual internships.

## **2. VIRTUAL INTERNSHIP**

Virtual internships represent unique transitional and temporary learning experiences including the use of technology integration (Jeskea & Axtell 2018). Supervisory engagement and commitment to the interns play a critical role to create meaningful learning. Likewise, the customized use of technology to interact, monitor, and engage with interns determine effectiveness in the program.

The traditional internship model does not serve well during a pandemic and should be adapted so that undergraduate students can complete their internship by working only remotely with faculty supervisor organization participation (Dent 2020). The virtual internship emphasises efficient communication platform for both students and supervisors. By leveraging innovative uses of contemporary technologies for communication, students are able to immerse themselves in experiential learning situations, and reflecting on online internship processes (Bay 2017).

The concept of virtual internships appear to be regarded as appropriate strategies that can not only support improved student retention in the short term, but offer new opportunities for enriched, broadened and more equitable internship experiences (Briant & Crowther 2020). Workplace-based internships, while offering high impact and authentic experiences, are often difficult for many students who are unable to attend workplaces to complete the required hours due to a range of other work, study, and life factors. The new remote internship, seeks to overcome these barriers.

Virtual internship calls for certain leadership methods to guide supervisors in attending their interns. Studies on effectiveness of supervisors and their tracking system in mentoring interns apply the theoretical lenses of path-goal theory of leadership (Adadi 2018). Focus on research questions such as how do supervisors contribute to the learning growth of interns and experiment study, the study shows an example how to address issues of virtual internship.

### 3. REVIEW OF INTERNSHIP FRAMEWORK

The Work-in-Progress paper reviews the literature on virtual internships framework across disciplines. Research into implementing virtual internships has appeared in education, technology, and management journals prior to 2020, with white papers and guides also published by government agencies. A very small number of researchers have conducted surveys and convened focus groups from participants in past virtual internships to gather student perspectives and insights into what makes these productive experiences. The most notable of these is Hora et al, which used a mixed-methods approach including surveys and interviews to characterize internships (Hora et al. 2021). Summary of the framework is presented in Table I.

Table 1: Virtual Internship Addressed Framework

Author	Domain	Content
(Delcoure et al. 2018)	business	Business internship system through student professional development, and facilitated via implementation of a step-wise construct process: (1) self-development, (2) on-campus development, and (3) applied development
(Hassan 2018)	Public higher education institution	The framework suggests five categories of stakeholders : students, general public, university administrators and the industry. Internship guideline comprised of the planning, implementation and assessment stages

(Goodenough et al. 2017)	higher education institution	Examine the effects of optional real-world internship placements on eight measures of resilience. Scores for optimism, purposeful direction and ingenuity significantly increased between start-of-year and end-of-year tests for interns versus a decline for non-interns. Facilitating student engagement with real-world issues and challenges through supported internships within an active learning framework is an important mechanism for increasing students' resilience.
(Roy & Sykes 2017)	hospitality	suggest a framework for an innovative approach to online internships after examining best practices in hospitality internships. Learning the ins and outs of an industry virtually, using contemporary internship methods strengthens the student's expertise and better prepares them for future workplace environments. Five components in the framework: planning, self regulated, engage, assimilate, reflect and review
(Bilsland et al. 2020)	Hospitality and tourism	A research concept framework that takes into account the changes to the hospitality and tourism industry due to COVID-19, subsequent changes to industry training mechanisms, and the potential implications for work-integrated learning internship placements for the future generation of students, graduates and industry professionals, is presented. The model consists of: internship and learning model, stakeholder, mediating factors, skills and service mindset.
(Ju et al. 2014)	Technical and managerial	Propose Proactive assessment for internship acceptance framework. The key success factors are • Trust and partner compatibility • Common and unique purpose • Shared governance and joint decision making • Clear understanding of roles and responsibilities • Open and frequent communication • Adequate financial and human resources.
(Briant & Crowther 2020)	Creative industry	Multi-disciplinary engagement of online internship framework. The framework contains four elements: social presence, cognitive presence, instructional presence and collaboration presence.
(Kapareliotis et al. 2019)	business	Work readiness instrument framework include soft skills, intrinsic and extrinsic motivation
(Oner 2020)	education	The analysis show technological pedagogical content knowledge in virtual internship. The TPACK representations gradually became more complex in

		terms of the number of pedagogical considerations and the strength of connections between pedagogical considerations, technology, and content.
(Dent 2020)	Business (IS digital marketing)	traditional internships can be adapted so that undergraduate students can complete their internship by working only remotely with site owner clients and active faculty and internship sponsoring organization participation. Presents Virtual Internship IS Tools for Digital Marketing and Website
(Li & Craig 2020)	Higher education	Virtual internship model presented in flow process diagram implied the interaction between the factors (career-oriented learning experiences, motivation, self-regulated learning) and career readiness.
(Mia et al. 2020)	Software engineering	A virtual internship platform in a blended learning environment to design a preferred virtual program that will overcome many limitations of professional skill development among final year computer science (CS) students or fresh graduates. In this research, we have designed a Virtual Internship System (VIS) that will solve the major problems of virtual workplace management and interconnect our young generation
(Jeskea & Axtell 2018)	Higher education	Nature of Relationships in e-Internships: the technology itself is not necessarily the problem, but rather it is how technology is used that influences the kind and depth of relationships and trust that is built between different parties. The nature of e-internships, the use of technology to facilitate work, and the distance between interns and organizations results in characteristics commonly associated with transitional and transactional contracts as a default (structural) constellation of e-internships.
(Bay 2017)	Higher education	Virtual internship required educators and students to immerse themselves in experiential learning situations, leveraging innovative uses of contemporary technologies for communication, and reflecting on online teaching processes
(Koopman et al. 2021)	Engineering	The Work-in-Progress paper reviews the literature on virtual internships across disciplines to find effective practices that can be applied to virtual engineering internships. The review sets the stage by a brief summary of research on traditional engineering internships and management of virtual teams before delving into findings on the opportunities and

		limitations as well as program design recommendations for virtual internships.
(Ali & Khushi 2018)	business	Identify effects of internship in the university students of Pakistan as an activity based learning in order to boost their skills and abilities. First of all, it builds it professionally develops the students by enhancing career opportunities for them, developing their network with the industry and exposing them to the real life challenges. On the other hand, internship projects can increase skills, zeal, enthusiasm and self-confidence in students in form of personal development.
(Anjum 2020)	business	internship programs on professional and personal development framework consists of factors: professional development, professional skills, personal growth, personal capabilities

#### 4. SELECTED FRAMEWORK

A few framework appears to be comprehensive and very much relevant to the current work. Therefore, the particular model could be used as foundation to the intended framework.

New virtual internship program emerges in response to the effects of COVID-19 in a creative industries faculty at a large Australian university (Briant and Crowther 2020).

Various changes to workplace activities, offers an opportunity to test a mode of internships as presented in Table 2. The framework contains four elements: social presence, cognitive presence, instructional presence and collaboration presence.

Table 2: Multi-disciplinary engagement of virtual internship

Elements	Categories	Indicators
Social Presence	Open communication Group cohesion Personal/Affective	<ul style="list-style-type: none"> <li>Students work in multi-disciplinary teams to build collaborative skills and understand that current practice settings involve cross disciplinary engagement</li> <li>'Interviews' with industry to secure the internship to develop professional development skills</li> <li>Weekly on-line catch-up gives students agency and enables the development of tacit skills including communication, professional engagement, teamwork and time management</li> <li>Industry partner meetings to include student teams to interact with organisation and participate in workplace culture settings</li> <li>Industry partner presentations give students the opportunity to pitch ideas professionally, reflect on their experiences, and receive formative feedback from industry</li> <li>The learning or knowledge of industry based skills</li> </ul>
Cognitive Presence	Triggering event Exploration Integration Resolution	<ul style="list-style-type: none"> <li>Industry brief developed collaboratively with students to address a key priority or task for that industry to be resolved through research and development with regular and consistent feedback by Industry</li> <li>Research the industry partner and broader industry to understand industry context and current practice environments</li> <li>Consult in multi-disciplinary team with partner</li> <li>Prepare and present report</li> </ul>
Teaching Presence	Design & organisation Facilitating discourse Direct instruction	<ul style="list-style-type: none"> <li>Project brief framework enables contribution from Industry and students to develop organisational task or priority while meeting key work integrated learning outcomes</li> <li>Schedule and activity timeline is developed to work with industry and student timeframes with additional flexibility due to frontloading prior to the semester</li> <li>Academic support/mentor engagement with students to guide assessment and progress</li> <li>Interim review of progress to date is arranged by student with industry supervisor to receive formative feedback</li> <li>Establishing and managing expectations with stakeholders</li> <li>Critical reflections on experiences</li> </ul>
Collegial Presence	Collaboration	<ul style="list-style-type: none"> <li>Scheduled and regular meetings with industry supervisor and student teams to maintain workplace interaction</li> <li>Regular feedback from Industry supervisor regarding project aims and objectives</li> <li>Industry mentoring for effective teamwork strategies and how to work collaboratively in a workplace environment</li> <li>Enabling teamwork as a core component of workplace culture</li> <li>Supporting reflective practice strategies through group discussion and formative feedback by Industry supervisor</li> <li>Support and mentor group reflections during organisational meetings</li> </ul>

Next, the extent to which psychological contracts appear to emerge and operate within this computer-mediated context in virtual internship requires particular attention (Jeskea and Axtell 2018). Virtual internships involve inimitable interim and provisional learning experiences with some limited understanding. In many virtual internship experiences, the technology appears not to be the keyproblem, but rather it is how technology is used that influences the kind and depth of relationships and trust that is built between different



parties. The nature of e-internships, the use of technology to facilitate work, and the distance between interns and organizations results in characteristics commonly associated with transitional and transactional contracts as a default (structural) constellation of e-internships is presented in Table 3.

Table 3: Technology use in virtual internship and psychological contract

	Contracts	Role of technology
Default (structural) constellation	Transitional/transactional: Internships are temporary; reflect exchange of work for learning experience/improved employability.	Passive and often one-directional: To maintain contact, monitor and manage communication with interns.
Potential constellation	Relational/balanced: Investment in relationship building; recruitment from intern pool.	Proactive and interactive: To teach/mentor interns, build trust/expertise and establish close relationships.

## 5. CONCLUSIONS AND FUTURE WORK

In order to create an effective virtual internships for students, key components should be addressed. Aspects like communication, organization, and clear prospects for all stakeholders namely interns, companies, and higher education require particular attention in virtual internship (Koopman et al. 2021). Likewise, further concerns in virtual internship entails attention for enrichment, fair access, and quality assurance in higher education context (Hora et al. 2021).

The review reveals substantial prospects for future work into the features of virtual internship from the traditional internships. The environment and surrounding of virtual internship has particular impact on learning outcomes and future career, and as well as to the software engineering curriculum. Issues such as the importance of virtual internships strategies by software engineering discipline would be addressed in coming works.

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