

Research-Informed Education Booklet

كتيب التعليم القائم على البحث العلمي

This document is part of a series that defines, explains, and demonstrates Qatar University's five Education Excellence Themes.



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التعليم التجريبي
EXPERIENTIAL EDUCATION

Qatar University

Center for Excellence in Teaching and Learning

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Introduction

Qatar University's mission is "to equip current and future citizens of Qatar with the skills, expertise and competencies they need to be able to contribute to, and lead, Qatar's development for the benefit of future generations" (Qatar University Strategy 2018–2022, p. 20). To achieve this, the university has rigorously pursued educational excellence. Having developed and implemented its Education Excellence Framework, the university aspires to be regionally recognized for the provision of holistic education. The five main themes of the Education Excellence Framework are: learner-centric, experiential, research-informed, digitally enriched, and entrepreneurial education. These five aspects of a holistic education will yield graduates who are well-rounded and who have attributes, competencies, and values that will enable them to maximize their future impact locally and internationally (Qatar University Strategy 2018-2022). This document is part of a series that defines, describes, explains, and demonstrates Qatar University's five themes for education excellence. This document focuses on **research-informed education**. The objectives of the document are to:

1. Motivate readers to relate the research-informed education theme to their educational backgrounds, professional practices and characteristics as instructors at Qatar University.
2. Familiarize readers with theory and research on research-informed education.
3. Demonstrate some of the teaching and learning skills required to implement research-informed education.
4. Introduce strategies for applying research-informed education in higher education.
5. Introduce methods of assessment appropriate for research-informed education in higher education.

This document was created for Qatar University educators and attempts to distill, organize, and highlight key elements from the vast amount of research, literature, and information on research-informed education that already exists in academia. This document references a wide variety of educational resources in order to identify critical points, perspectives, practices, and definitions of research-informed education and attempts to guide the reader through some of the steps necessary to structure and implement research-informed educational practices in Qatar University contexts.

Overview of Research-Informed Education

Positive interactions between teaching and research define higher education. Indeed, these interactions are considered as an essential element in higher education. Research-informed teaching emphasizes the knowledge-production process, encourages the development of research and inquiry skills in students, and helps to establish a culture and community of research where students are inspired to think about the process of knowledge development and how to engage actively in it themselves. According to Childs et al., (2007) research-informed teaching can be defined as "student engagement from induction to graduation, individually and in groups, in research and inquiry into disciplinary, professional and community-based problems and issues, including involvement in knowledge exchange activities" (cited in Healey & Jenkins 2009). Research-informed education is closely aligned with learner-centric education goals and emphasizes students' involvement as active participants in the learning process. Educators should strive to enrich and enhance their pedagogical repertoire by integrating inquiry-based research activities in their classes. An inquiry-based, research-integration process will vary by academic discipline, but generally involves students either learning about instructors' research and/or ways to engage in research themselves. Table (1) outlines the educational, professional, and personal benefits for students engaged in research-informed education.

Educational benefits	Professional benefits	Personal benefits
<ul style="list-style-type: none"> - Working with a faculty mentor. - Learning about issues, methods, and leaders in their chosen field. - Applying concepts from their courses to "real life" situations. - Furthering their creative achievement. - Sharpening their problem-solving skills. 	<ul style="list-style-type: none"> - Exploring potential careers. - Enhancing their professional communication skills. - Learning new techniques and skills for their career. - Preparing for graduate or professional school. - Networking with others who share their interests. 	<ul style="list-style-type: none"> - Growing as critical and independent thinkers. - Building confidence and the ability to work independently. - Enhancing awareness of ethical issues.

Table (1): Educational, professional and personal benefits for students engaged in research-informed education.

Retrieved from: The University of Texas website



Overview of Theory Supporting Research- Informed Education

This section discusses constructivism as an epistemology that influences research-informed approaches. Constructivism holds that students actively construct their knowledge. The four main principles of constructivism are as follows: (1) knowledge is constructed rather than innately or passively absorbed; (2) learning is an active, rather than a passive process; (3) all knowledge is socially constructed and hence needs social interaction; and (4) all knowledge is personal, that is, each learner has a distinctive point of view based on his/her existing knowledge and values. A constructivist approach to education aims to provide students with experiences that facilitate the construction of their knowledge. While a traditional approach to teaching focuses on delivering information to students, the constructivists believe in the personal construction of meaning by the learner through experience.

In short, constructivism enables students to develop a critical approach to learning, which is required for a successful implementation of research-informed educational practices. Research is based on the traditions of debate, argument, reasoning and evidence. Hence, knowledge is viewed as provisional and contestable. Students' knowledge represents their best understanding at a point in time. However, they may have to change their perspectives if new, more convincing evidence or theories arise. This leads to an approach to learning where students continually explore, pose questions, and test hypotheses. Consequently, in research-informed education, students take a position and put forward an argument to justify it. In simple terms, that means the students address a particular issue or study a specific problem and offer their own answers or interpretations, which are based on their reading, thinking, discussion and research. In challenging or accepting the work of others, and in stating their own positions, students attempt to support their claims with reasoning and evidence.

Research-Informed Education Practices in Higher Education

In order to implement research-informed education, instructors need to build communities of scholarly inquiry that challenge old divisions between research and teaching, between teachers and learners, and between higher education institutions and society. Fung (2017) presented a framework for building communities of scholarly inquiry in higher education based on a core educational principle: students should learn predominantly through research and critical inquiry rather than passively receiving accepted knowledge. Fung's framework consists of six dimensions: 1) connecting students directly with researchers and with institutions of research, 2) encouraging students to make connections between different disciplinary perspectives, 3) empowering students to engage external audiences with the findings of their inquiry, 4) encouraging students to connect their academic knowledge with their future careers, 5)

encouraging students to produce outputs directed toward an audience and 6) encouraging students to connect with each other, across phases and with alumni.

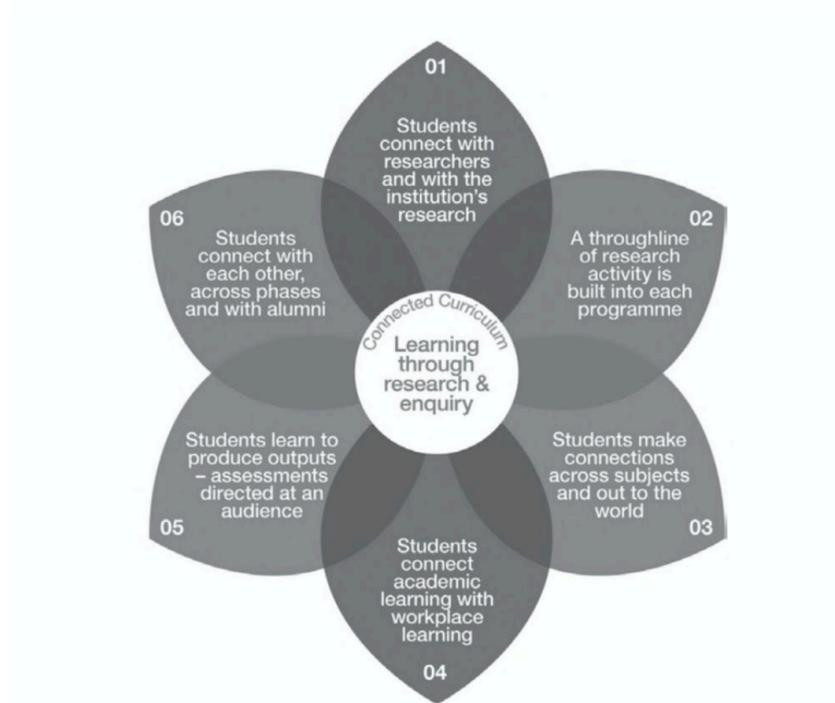


Figure (1): Fung's framework for building communities of scholarly enquiry in higher education.

The question then becomes how to adopt Fung's framework within a higher education classroom setting. One possible answer can be found in Healey and Jenkins (2009), who offered four different approaches for applying researched-informed education to higher education:

1. **Research-led teaching.** This approach allows students to learn about other researchers' work in their field. To achieve this, the instructor could ask students to read specific, empirically validated studies related to their course, which can include the instructor's own studies. Upon finishing the reading, the students could then describe the study's research intent, research methodology and findings. Here, teaching could take the form of basic lectures, basic exercises, basic seminars, tutorials, guest lecturers, lecture series of research projects, etc.
2. **Research-oriented teaching.** This approach provides students with the various techniques and skills needed to solve research problems. The instructor could give students insights into scientific research in their discipline, enabling students to construct their own hypotheses and research questions for a given research problem. They could then use this outline to execute laboratory tasks, or

investigations, or field research. Students should also be given practical training on how to use research facilities and communicate research results with their instructors, peers, and community. Teaching could take the form of research exercises, workshops, specialised training relevant to the course, laboratory experiences, tutorials, etc. Also, research-oriented teaching can occur through extracurricular activities like research or paper-writing clubs.

3. **Research-based teaching.** This approach enables students to gain knowledge and understanding of subject matter through research activities. The instructor engages students in problem-solving activities, case studies, field trips, simulation activities and small-scale research projects. Both the instructor and the students should engage in the inquiry process, with the teacher acting as a more experienced research ‘partner’. Teaching can take the form of project workshops and self-development activities.
4. **Research-tutored teaching.** This approach empowers students to learn about research findings by engaging in research discussions. **Research-tutored teaching** might include project seminars, training at large-scale research facilities, field exportations, excursions, etc.

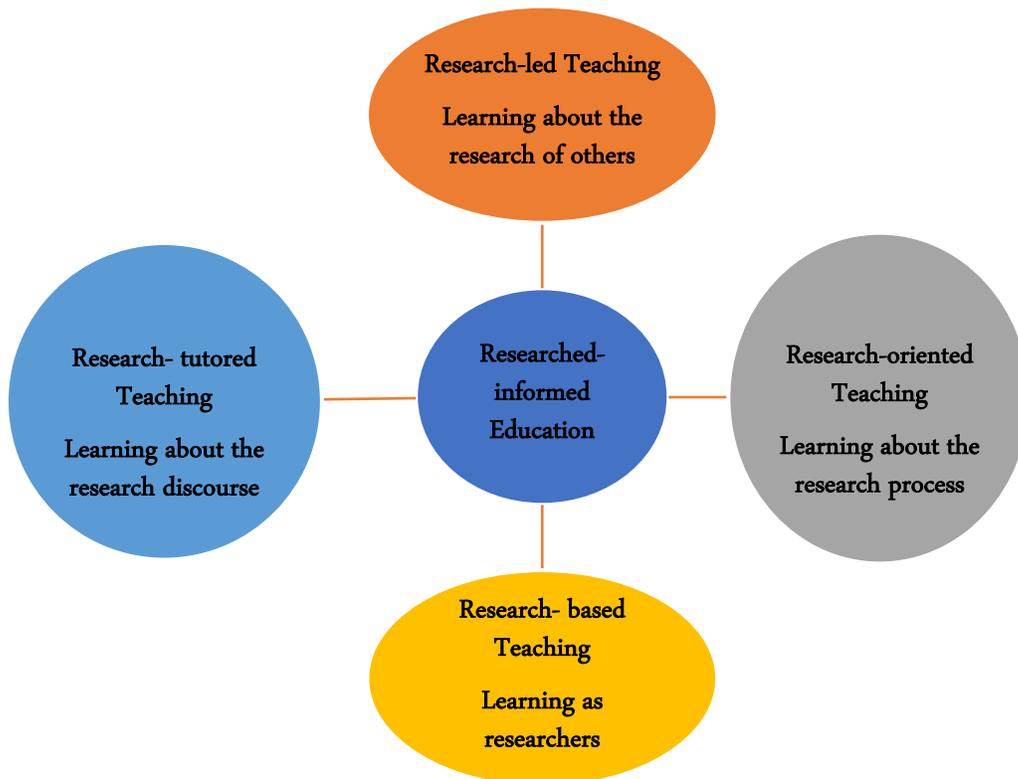


Figure (2): Approaches for applying researched-informed education in higher education.

Which ‘research-informed’ approaches should instructors at Qatar University adopt?

Some have argued that both the research-led and research-oriented teaching approaches are ‘teacher-focused’– that is, the emphasis is on the dissemination of information acquired by the instructor (Sheffield Hallam University Research Archive, 2017). In contrast, research-based and research-tutored teaching approaches can be described as student-focused; they emphasise students learning by doing (Sheffield Hallam University Research Archive, 2017). Hence, the teacher-focused approaches are most effective when instructors need to enhance students’ understanding or knowledge; the student-focused approaches are most effective when students need to explore the knowledge on their own. The literature describing optimal methods for implementing research-informed educational practices calls for a blend of the four research-informed approaches. To achieve this, academic programs and courses should be designed so that they begin with an element of knowledge transfer and then attempt to involve the students as active participants in research activities. They should prioritise developing students’ research skills over just knowledge acquisition, ultimately providing advanced students with relevant and overt research experiences.

Forms of students’ research experiences in higher education

There is no single way to engage students in higher education in research. What all undergraduate research experiences have in common is that they give students firsthand experience in (re)constructing knowledge. The learning objectives should guide a faculty member in choosing the form and intensity of an undergraduate research experience. Research experiences for undergraduate students can take many forms. Next are some examples:

Individual Project	Individual research includes theses, independent studies, creative projects, among others. The research topic can be proposed by the faculty or selected by the student. Faculty supervises and guides the student's research project.
Assistance on a research project	Serving as a research assistant involves working with a faculty member or a graduate student on an existing research project. Such an experience constitutes a valuable training for students regarding how to conduct a research. The undergraduate student's contributions range from data collection to substantial intellectual contributions that lead to co-authorship.
Research Teams	Students collaborate on a research project. They may split up the responsibilities and duties of a research project or share them. A mentor must conceive a research question that can be answered in small projects attainable by undergraduate researchers in reasonably short periods. Students will develop research, teamwork and collaboration skills.
Capstone experiences	Capstone include senior research projects and honors research experiences that allow undergraduate students to develop and explore a research question of their own.

Table (2): Forms of undergraduate research experiences



How to strengthen students' research skills?

In their book, *The Craft of Research*, Booth et al. (2003) proposed ideas for strengthening students' research skills. According to them, faculty members should work towards allowing students to practice research-questioning strategies through the use of different organisational and disciplinary frameworks, historical and stakeholder perspectives, etc. Students should also practice critical and close reading skills. In order to develop critical reading skills, students should be allowed to practice paraphrasing with proper citation of the key ideas, questions, conflicts, and themes found in course readings. As for students' close reading skills, faculty members should encourage students to identify language patterns, argument patterns, logical reasoning patterns, strands, and oppositions. Equally important, faculty members should work towards increasing students' chances of developing these statements. Students can approach a research assignment from three different perspectives: analytical, expository, and argumentative. This is better done in groups of three, with each student developing a thesis from a differing perspective. The group members then share their thesis statements and discuss how they would proceed with research, analysis, and support. Additionally, students need to practice evaluating the validity of internet sources i.e., they are required to justify their choice of electronic citations. Perhaps most importantly, faculty members should work towards allowing students to practice converting pure research to applied research. That is, once conclusions are developed from pure research, students need to develop an action plan for participation in (real or hypothetical) program development, policy revision, writing a position paper, or volunteer work. Finally, faculty members need to encourage students to plan for a senior thesis or project. In this case, students can use several field experiences as a catalyst for a larger project.

Research-Informed Education Assessment in Higher Education

Below are some assessment methods that can be used in research- informed classroom.

1. Surveys for assessing students' research skills

Assessing students' research skills is critical in research-informed education. Research is a complex activity that necessitates diverse sub-skills such as procedural skills (e.g., using a database), critical thinking skills (e.g., evaluating results) and strategic thinking skills (e.g., knowing what tools and procedures are appropriate for conducting a certain study). Furthermore, students must be able to effectively integrate all of these skills. It is likely that most first-year university students will not already possess these skills, as many of their high school research assignments accepted Wikipedia or Google as sources. In addition, instructors may correlate their students' technological competencies with solid research skills; however, research skills must be taught and practiced. Hence, once an instructor decides what particular research skills are important in the course, she or he should design and apply the following series of surveys: (1) a pre-research assessment survey, (2) a mid-research assessment survey and (3) a post-research assessment survey (see table 3). An example of post-research assessment survey that was developed by the University of Colorado can be found in this link:

<https://www.colorado.edu/eer/research-areas/undergraduate-research/evaluation-tools-undergraduate-research-student-self>

Pre-research assessment survey	Mid-research assessment survey	Post-research assessment survey
The students complete this survey at the beginning of the research experience. It aims to help instructors understand their students' views, expectations, interests, knowledge and skills.	The students complete the same survey as the one used in the pre-research stage.	The students complete the same survey for a final time at the end of the research experience. Any changes in scores will illustrate growth (or lack thereof) and the research experience's impact.

Table (3): Types of self-assessment surveys

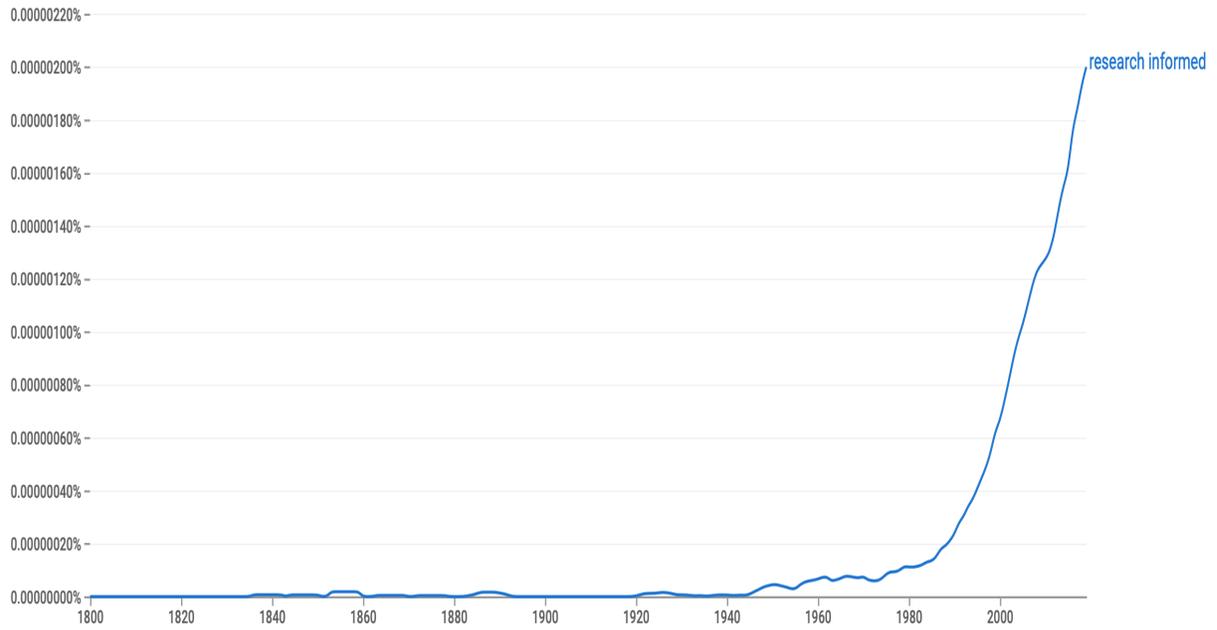
2. Group discussion for assessing students' and instructors' experiences

Most of the available methodologies for assessing students' and instructors' experiences in conducting research activities involve structured conversations between the two groups so that each has an opportunity to share their experiences and help the other to explore their strengths and weaknesses. The main purpose of the discussion is to provide an in-depth exploration of students' and instructors' reactions to the research program and to their experiences of it. The role of the facilitator is to raise issues and ask questions that the students and instructor can address. Following the discussion, the facilitator should code the remarks into discrete categories and prepare a summary organised according to those categories. This draft should be shared so that all parties can reflect on their research experiences.

3. Case studies for assessing the overall success and impact of students' research activities

Case studies use multiple data sources to provide a comprehensive description and analysis of students' research activities. In research-informed education, expletory case studies can be used to assess the overall success and impact of students' research experiences. This begins with identifying the desired student learning outcomes. The next step involves identifying the instruments for measuring students' progress toward these outcomes (e.g., surveys, focus group interviews, semi-structured interviews, direct and participant observation, photos and drawings). Using a combination of these methods captures a comprehensive picture of the research experience and impact being assessed. The assessment method should also measure skills such as: autonomy, ability to deal with obstacles, practice and process of inquiry, critical thinking, problem solving, understanding ethical conduct, communication and creativity. Singer and Zimmerman (2012) provided an example of using case studies in assessing the overall success and impact of students' research activities.

A Google Ngram Reader Search of the Term Research- Informed Education



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