ICER 2022 Review Process and Guidelines

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This document is a living document intended to capture the reviewing policies of the ICER community. Please email the Program Co-Chairs at pc-chairs@icer.acm.org with comments or questions; all will be taken into account when updating this document for ICER 2023.

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1. Goals of the ICER Reviewing Process

The ICER Reviewing Process as outlined in this document is designed to support reaching the following goals:

- Accept high quality papers
- Give clear feedback to papers of insufficient quality
- Evaluate papers consistently
- Provide transparency in the review process
- Embrace diversity of perspectives, but work in an inclusive, safe, collegial environment
- Drive decisions by consensus among reviewers
- Strive for manageable workload for PC members
- Do our best on all of the above

2. Action Items

Prior to continuing to read this document, please do the following:

- Read the call for papers at https://icer2022.acm.org/track/icer-2022-papers. This is the ground truth for scope and submission requirements. We expect you to account for these in your reviews.
- Read the author guidelines at https://icer2022.acm.org/track/icer-2022-papers#Author-Guidelines. We expect your reviews and meta-reviews to be consistent with these guidelines.

After having read this document, please block off a number of time slots in your calendar:

- [Reviewers and Meta-Reviewers:] Saturday, March 19, 2022 through Friday, March 25, 2022: Reserve at least two hours to read all abstracts and bid for papers to review (see Step 2: Reviewers and Meta-Reviewers Bid for Papers).
- [Reviewers:] Friday, April 1, 2022 through Friday, April 29, 2022: Reserve enough time to review 5-6 papers (see Step 6a: Reviewers Review Papers). In general, it is highly recommended to spread the reviews over the full four weeks instead to trying to write them just in time. Notify the PC chairs immediately in case of emergencies that might prevent you from submitting reviews by the deadline.
- [Reviewers and Meta-Reviewers:] Saturday, April 29, 2022 through Friday, May 6, 2022: Reserve one one-hour slot during the weekend and 20-minutes slot each day of the week to log into HotCRP, read the other reviews, check on the discussion status of each of your papers, and comment where appropriate (see Step 7: Reviewers and Meta-Reviewers Discuss Reviews).
- [Meta-Reviewers:] Saturday, April 29, 2022 through Wednesday, May 11, 2022: Reserve three hours in total to you to prepare (and update, as necessary) the meta-reviews for your assigned papers (see Step 8: Meta-Reviewers Write Meta-Reviews).
- [Meta-Reviewers:] Wednesday, May 18, 2022 through Friday, May 20, 2022: Reserve two two-hour slots for synchronous SPC meetings (see Step 9: PC Chairs and Meta-Reviewers Discuss Papers; the PC chairs will be reaching out to schedule these meetings).
- [Meta-Reviewers:] Wednesday, June 1, 2022 through Sunday, June 5, 2022: Reserve two hours for checking any "conditional accept" revisions that may affect your papers (see Step 13: Meta-Reviewers Check Revised Papers).

If you are new to reviewing in the Computing Education Research community, the following ITiCSE Working Group Report may serve as an introduction:

Petre M, Sanders K, McCartney R, Ahmadzadeh M, Connolly C, Hamouda S, Harrington B, Lumbroso J, Maguire J, Malmi L, McGill MM, Vahrenhold J. 2020. '*Mapping the Landscape of Peer Review in Computing Education Research*.' In *ITiCSE-WGR '20: Proceedings of the Working Group Reports on Innovation and Technology in Computer Science Education*, edited by Rößling G, Krogstie B, 173-209. New York, NY: ACM Press. doi: 10.1145/3437800.3439207.

3. Submission System

ICER 2022 uses the HotCRP platform for its reviewing process. If you are unfamiliar with this, you will find a basic tutorial below.

But first, make sure you can sign in, then bookmark it: http://icer2022.hotcrp.com

If you have trouble signing in, or you need help with anything, contact James Prather <james.prather@acu.edu> and Dastyni Loksa <dloksa@towson.edu>, the ICER 2022 submission chairs, for help.

Make sure that you can log in to HotCRP and that your name and other metadata is correct. Check that emails from HotCRP are not marked as spam and that HotCRP email notifications are enabled.

4. Roles in the Review Process

Program Committee (PC) Chairs

Each year there are two program committee co-chairs. The PC chairs are solicited by the ICER steering committee and appointed by the SIGCSE board to serve a two-year term. One new appointment is made each year so that in any given year there is always a continuing program chair from the prior year and a new program chair. Appointment criteria include prior attendance and publication at ICER, past service on the ICER Program Committee, research excellence in Computing Education, collaborative and organizational skills to share oversight of the program selection process. The ICER Steering Committee solicits and selects candidates for future PC chairs.

Program Committee (PC) Members / Reviewers

PC members write reviews of submissions, evaluating them against the review criteria. The PC chairs invite and appoint the reviewers. The committee is sized so that each reviewer will serve for 5-6 paper submissions, or more depending on the size of the submissions pool. Each reviewer will serve a one-year term, with no limits on reappointment. Appointment criteria include expertise in relevant areas of computing education research and past reviewing experience in computing education research venues. Together, all reviewers constitute the program committee (PC). The PC chairs are responsible for inviting returning and new members of the PC, keeping in mind the various forms of diversity that are present at ICER.

Senior Program Committee Members (SPC) / Meta-Reviewers

SPC members *review* the PC members' reviews, ensuring that the review content is constructive and aligned with the review criteria, as well as summarizing reviews and making recommendations for a paper's acceptance and rejection. They also moderate discussions about each paper and provide feedback on reviews if necessary, asking reviewers to improve the quality of reviews. Finally, they participate in a synchronous SPC meeting to make final recommendations about each paper, and review authors' minor revisions.

The PC chairs invite and appoint Senior PC members, with the approval of the steering committee, again, keeping in mind the various forms of diversity that are present at ICER. Each Senior PC member can be appointed for up to three years in a row; after a hiatus of at least one year, preferably two years, re-appointment is possible. The committee is sized so that each meta-reviewer will handle 8-10 papers, depending on the submission pool.

5. Principles Behind ICER Reviewing

The ICER review process is designed to work towards these goals:

- Maximize the alignment between a paper and expertise required to review it.
- Minimize conflicts of interests and promoting trust in the process.
- Maximize our community's ability to make excellent, rigorous, trustworthy contributions to the science of computing education.

The call for papers and author guide should make this clear, but ICER is broadly scoped.

The conference publishes research on teaching and learning of computer science content that happens in any context. In consequence, reviewers should not downgrade papers for being about a topic they personally perceive to be less important to computing education. If the work is sufficiently ready for publication and reviewers believe it is of interest to some part of the computing education community, it should be published such that the community can decide its importance over time.

6. Conflicts of Interest

ICER takes conflicts of interest, both real and perceived, quite seriously.

The conference adheres to the ACM conflict of interest policy (https://www.acm.org/publications/policies/conflict-of-interest) as well as the SIGCSE conflict of interest policy (https://sigcse.org/policies/COI.html). These state that a paper submitted to the ICER conference is a conflict of interest for an individual if at least one of the following is true:

- The individual is a co-author of the paper
- A student of the individual is a co-author of the paper
- The individual identifies the paper as a conflict of interest, i.e., that the individual does not believe that he or she can provide an impartial evaluation of the paper.

The following policies apply to conference organizers:

- The chairs of any track are not allowed to submit to that track.
- All other conference organizers are allowed to submit to any track.
- All reviewers (PC members) and meta-reviewers (SPC members) are allowed to submit to any track.

No reviewer, meta-reviewer, or chair with a conflict of interest in the paper will be included in any evaluation, discussion, or decision about the paper.

It is the responsibility of the reviewers, meta-reviewers, and chairs to declare their conflicts of interest throughout the process. The corresponding actions are outlined below for each relevant step of the reviewing process.

It is the responsibility of the chairs to ensure that no reviewer or meta-reviewer is assigned a role in the review process for any paper for which they have a conflict of interest.

7. The Reviewing Process

Step 1: Authors Submit Abstracts

Authors will submit a title and abstract one week prior to assigning papers.

Authors are allowed to revise their title and abstract before the full paper submission deadline.

Step 2: Reviewers and Meta-Reviewers Bid for Papers

Reviewers and meta-reviewers will be asked to bid on papers for which they have sufficient expertise—in both phenomena and methods—and then the PC chairs will assign papers based on these bids.

The purpose of bidding is not to express interest in papers you want to read. It is to express your expertise and eligibility for fairly evaluating the work. These are subtly but importantly different purposes.

- Specify all of your conflicts of interest. Conflicts are any situation where you have any connection with a submission that is in tension with your role as an independent reviewer (you advised an author, you have collaborated with an author, you are at the same institution, you are close friends, etc.). After declaring conflicts, you will be excluded from all future evaluation, discussion, and decisions of that paper. Program chairs and submissions chairs will also specify conflicts of interest at this time.
- Bid on all of the papers you believe you have sufficient expertise to review. Sufficient expertise includes knowledge of research methods used and prior research on the phenomena. Practical knowledge of a topic is helpful, but insufficient.
- Do not bid on papers about topics, techniques, or methods that you strongly oppose. That precludes authors from being fairly reviewed by authors with negative bias; see below for positive biases and how to control for them.

Step 3: Authors Submit Papers

Submissions are due one week after the abstracts are due.

As you read in the submission instructions (https://icer2022.acm.org/track/icer-2022-papers#Submission-Instructions), submissions are supposed to be sufficiently anonymous that a reader cannot determine the identity or affiliation of the authors. The main purpose of ICER's anonymous reviewing process is to reduce the influence of potential (positive or negative) biases on reviewers' assessments. You should be able to review the work without knowing the authors or their affiliations.

Do not try to find out the identity of authors. (Most guesses will be wrong anyway.)

See the submission instructions for what constitutes sufficient anonymization. When in doubt, write the PC chairs for clarity at *pc-chairs@icer.acm.org*.

Step 4: PC Chairs Decide on Desk-Rejects

The PC chairs, with the help of the submissions chairs, will review each submission for papers that violate anonymization requirements, length restrictions, or plagiarism policies. Authors of desk rejected papers will be notified immediately.

The PC chairs may not catch every issue. If you see something during review that you believe should be desk rejected, contact the chairs before you write a review; the PC chairs will make the final judgement about whether something is a violation, and give you guidance on whether and if so how to write a review.

Managing Conflicts of Interest

PC chairs with conflicts are excluded from deciding on desk rejected papers, leaving the decision to the other program chair.

Step 5: PC Chairs Assign Reviewers

Based on the bids and their judgement, the PC chairs will collaboratively assign at least three reviewers (PC members) and one meta-reviewer (SPC member) for each submission. The PC chairs will be advised by HotCRP's assignment algorithm, which depends on all bids being high quality.

Remember, for these assignments to be fair and good, your bids should only be based on your expertise and eligibility. Interest alone is not sufficient for bidding on a paper. The chairs will review the algorithm's assignments to identify potential misalignments with expertise.

Managing Conflicts of Interest

PC chairs with conflicts are excluded from assigning reviewers to any papers for which they have a conflict. Assignments in HotCRP can only be made by a PC chair without a conflict.

Step 6a: Reviewers Review Papers

Assigned reviewers submit their anonymous reviews through HotCRP by the review deadline, evaluating each of their papers against the review criteria (see Review Criteria).

The time allocated for reviews is four weeks in which 5-6 reviews need to be written. Due to the internal and external (publication) deadlines, there cannot be any extensions.

Managing Conflicts of Interest

Reviewers, meta-reviewers, and PC chairs with conflicts cannot see any of the reviews of the papers they are conflicted on during this process.

Step 6b: Meta-Reviewers and PC Chairs Monitor Progress

Meta-reviewers and PC chairs will periodically check in to ensure that progress is being made.

Step 7: Reviewers and Meta-Reviewers Discuss Reviews

After the reviewing period, the assigned meta-reviewer asks the reviewers to read the other reviewers' reviews and begin a discussion about any disagreements that arise. All reviewers are asked to do the following:

- Read all the reviews of all papers assigned (and re-read your own reviews).
- Engage in a discussion about sources of disagreement.
- Use the review criteria to guide your discussions.
- Be polite, friendly, and constructive at all times.
- Be responsive and react as soon as new information comes in.
- Remain open to other reviewers shifting your judgements.

If your judgement does shift, update your review to reflect your new views. There is no need to indicate to the authors that you changed your review but do leave a comment for the other reviewers and the meta-reviewer indicating what you changed and why (HotCRP does not track changes).

Discussing a paper is not about who wins or who is right. It is about how, in the light of all information, a group of reviewers can find the best decision on a paper. All reviewers (and the authors!) have their unique perspective and competence. It is perfectly normal that they may have seen things you have not, just as you may have seen things they have not. The important thing is to accept that the group will see more than the individual. Therefore, you can always (and are encouraged to!) shift your stance in light of the extra knowledge.

The time allocated for this discussion is one week. As discussions about disagreeing reviews may take several (asynchronous) rounds, it is important to check in daily to see whether any new discussion items warrant attention. PC chairs will periodically check in.

If you have configured HotCRP notifications correctly, you will be notified as soon as new information (another review or a new discussion item) about your paper comes in. It is important that you react to these, and as soon as possible. Do not let your colleagues wait for days when all that is needed is some short statement from your side.

Managing Conflicts of Interest

Reviewers, meta-reviewers, and PC chairs with conflicts cannot see any of the discussions of the papers they are conflicted on during this process.

Step 8: Meta-Reviewers Write Meta-Reviews

After the discussion phase, meta-reviewers use the reviews, the discussion, and their own evaluation of the work to write a meta-review and recommendation.

A meta-review should summarize the key strengths and weaknesses of the paper, in light of the review criteria, and explain how these led to the decision. The summary and explanation should help the authors in revising their work where appropriate. A generic meta-review ("After long discussion, the reviewers decided that the paper is not up to ICER standards, and therefore rejected the paper") is not sufficient.

There are four possible meta-review recommendations: reject, discuss, conditional accept, and accept. The recommendation needs to be entered in the meta-review.

- Reject. Ensure that the meta-review constructively summarizes the reviews and the rationale for rejection. The PC chairs will review all meta-reviews to ensure that reviews are constructive, and may request meta-reviewers to revise their meta-reviews as necessary. The PC chairs will make the final rejection decision based on the meta-review rationale; if necessary, this paper will be discussed at the SPC meeting.
- Discuss. Ensure that the meta-review summarizes the open questions that need to be resolved at the SPC meeting discussion, where the paper will either be recommended as reject, conditional accept, or accept. Papers marked discussed will be scheduled for discussion at the SPC meeting. All papers for which the opinion of the meta-reviewer and the majority of reviewer recommendations do not align should be marked "discuss" as well.

- Conditional Accept. Ensure that the meta-review explicitly and clearly states the conditions that must be met with minor revisions before the paper can be accepted. To accept with conditions, the conditions must be feasible to make within the one-week revision period, so they must be minor. The PC chairs will make the final decision on whether the requested revisions are minor enough to warrant conditional acceptance; if necessary, this paper will be discussed at the SPC meeting.
- Accept. These papers will be accepted, assuming authors deanonymize the paper and meet the final version deadline. For technical reasons, "accept" recommendations are recorded internally as "conditional accept" recommendations that do not state any conditions for acceptance other than submitting the final version. The PC chairs will make the final acceptance decision based on the meta-review rationale; if necessary, this paper will be discussed at the SPC meeting.

Managing Conflicts of Interest

Reviewers, meta-reviewers, and PC chairs with conflicts cannot see any of the recommendations or meta-reviews of the papers they are conflicted on during this process.

Step 9: PC Chairs and Meta-Reviewers Discuss Papers

The PC chairs will host synchronous SPC meetings with all available meta-reviewers (SPC members) to discuss and decide on all "discuss" and "conditional accept" papers.

Before this meeting, a second meta-reviewer will be assigned to each such paper, ensuring that there are at least two meta-reviewers to facilitate discussion. Each meta-reviewer assigned to a paper should come prepared to present the paper, its reviews, and the HotCRP discussion. Each meta-reviewer's job is to present their recommendation, and/or if they requested discussion, present the uncertainty that prevents them from making one.

All meta-reviewers who are available to attend a SPC meeting session should, at a minimum, skim each of the papers to be discussed and their reviews (excluding those for which they are conflicted), so they are familiar with the papers and their reviews prior to the discussions.

At the meeting, the goal is to collectively reach consensus, rather than relying on the PC chairs alone to make final decisions. Papers may move from "discuss" to either "reject", "conditional accept", or "accept"; if there are conditions, they must be approved by a majority of the non-conflicted SPC and PC chairs at the discussion.

After a decision is made in each case, the original SPC member will add a summary of the discussion at the end of their meta-review, explaining the rationale for the final decision, as well as any conditions for acceptance, and updating the recommendation tag in HotCRP.

Managing Conflicts of Interest

Meta-reviewers conflicted on a paper will not be assigned as a second reader. Any meta-reviewer or PC chair conflicted on a paper will be excluded from the paper's discussion, returning after the discussion is over.

Step 10: PC Chair Review

Before announcing decisions, the non-conflicted PC chairs will review all meta-reviews to ensure as much clarity and consistency with the review process and its criteria as possible.

Managing Conflicts of Interest

PC chairs cannot change the outcome of an accept or reject decision after the SPC meeting.

Step 11: Notifications

After the SPC meeting, the PC chairs will notify all authors of the decisions about their papers; these notification will be via email through HotCRP. Papers that are (unconditionally) accepted will be encouraged to make any changes that may have been suggested but not required; papers that are conditionally accepted will be reminded of the revision evaluation deadline.

Step 12: Authors of Conditionally Accepted Papers Revise their Papers

Authors of conditionally accepted papers have one week to incorporate the requested revisions and to submit their final versions for review by the assigned meta-reviewer.

Step 13: Meta-Reviewers Check Revised Papers

Meta-reviewers will check the revised papers against the required revisions. Based on the outcome of this, they will change their recommendation to either "accept" or "reject" and will update their meta-reviews to reflect this.

Managing Conflicts of Interest

Reviewers, meta-reviewers, and PC chairs with conflicts cannot see any of the recommendations or meta-reviews of the papers they are conflicted on during this process.

Step 14: Notifications

PC chairs will sanity-check all comments on those papers for which revisions were submitted. Conditionally accepted papers for which not revisions were received will be marked as "reject". PC chairs then finalize decisions.

After this review, all recommendations will be converted to official **accept** or **reject** decisions in HotCRP and authors will be notified of these final decisions via email sent through HotCRP.

Authors will then have one week to submit to ACM TAPS for final publication.

Managing Conflicts of Interest

Reviewers, meta-reviewers, and PC chairs with conflicts cannot see any of the recommendations or meta-reviews of the papers they are conflicted on during this process. PC chairs with conflicts cannot see or edit any final decision on these papers.

8. Review Criteria

ICER currently evaluates papers against the following reviewing criteria, as independently as possible. These have been carefully chosen to be inclusive to many phenomena, epistemologies, and contribution types.

> Criterion A: The submission is grounded in relevant prior work and leverages available theory when appropriate.

> Criterion B: The submission describes its methods and/or innovations sufficiently for others to understand how data was obtained, analyzed, and interpreted, or how an innovation works.

> Criterion C: The submission's methods and/or innovations soundly address its research questions.

> Criterion D: The submission advances knowledge of computing education by addressing (possibly novel) questions that are of interest to the computing education community.

> Criterion E: Discussion of results clearly summarizes the submission's contributions beyond prior work and its implications for research and practice.

> Criterion F: The submission is written clearly enough to publish.

To be published at ICER, papers should be positively evaluated on all of these. The summary of this is another criterion:

> Summary: Based on the criteria above, this paper should be published at ICER.

Below, we discuss each criterion in turn.

Criterion A: The submission is grounded in relevant prior work and leverages available theory when appropriate.

Papers should draw on relevant prior work and theories, and explicitly show how they are tied to the questions addressed. After reading the paper, one should feel more informed about prior literature and how that literature is related to the paper's contributions. Such coverage of related work might come before a work's contributions, or it might come after (e.g, connecting a new theory derived from observations to prior work. Note that not all types of research will have relevant theory to discuss, nor do all contribution types need theory to make significant advances. For example, a surprisingly robust but unexplained correlation might be an important discovery that later work could develop theory to explain.

Reviewers should identify related work the authors might have missed and include pointers. Missing a paper that is relevant, but would not dramatically change the paper, is not sufficient grounds for rejecting a paper. Such citations can be added upon reviewers' request prior to publication. Instead, criticism in reviews that leads to downgrading a paper should focus on missing prior work or theories that would significantly alter research questions, analysis, or interpretation of results.

Guidelines for (Meta-)Reviewers

Since prior work and theories needs to be covered sufficiently and in a meaningful way but not necessarily completely, (meta-)reviewers are asked to do the following:

- Refrain from downgrading work based on missing one or two peripherally related papers. Just note them, helping the authors to broaden their citations.
- Refrain from downgrading work based on not citing the reviewer's own work, unless it really is objectively highly relevant.
- Refrain from downgrading work based on where in a paper they address prior work. Sometimes a dedicated section is appropriate, sometimes it is not. Sometimes prior work is better addressed at the end of a paper, not at the beginning.
- Make sure to critically note if work simply lists papers without meaningfully addressing their relevance to the paper's questions or innovations.
- Refrain from downgrading work based on making discoveries inconsistent with theory. The point of empirical work is to test and refine theories, not conform to them.
- Refrain from downgrading work based on not building upon theory when there is no sufficient theory available that can be pointed out in the review. Conversely, if there is a missing and relevant theory, it should be named.
- Refrain from downgrading work based on not using the reviewer's interpretation of a theory. Many theories have multiple competing interpretations and multiple distinct facets that can be seen from multiple perspectives.

Criterion B: The submission describes its methods and/or innovations sufficiently for others to understand how data was obtained, analyzed, and interpreted, or how an innovation works.

An ICER paper should be self-contained in the sense that readers should be able to understand most of the key details about how the authors conducted their work or made their innovation possible. This is key for replication and meta-analysis of studies that come from positivist or post-positivist epistemologies. For interpretivist works, it is also key for what Checkland and Howell called "recoverability" (See Tracy et al. 2010 for a detailed overview for evaluating qualitative work). Reviews thus should focus on omissions of research process or innovation details that would significantly alter your judgment of the paper's validity.

Guidelines for (Meta-)Reviewers

Since ICER papers have to adhere to a word count limit and since there are always more details a paper can describe about methods, (meta-)reviewers are asked to do the following:

- Refrain from downgrading work based on not describing *every* detail.
- Refrain from asking authors to write substantially new method details *unless* you can identify content for them to cut, or there is space to add those details within the length restrictions.
- Refrain from asking authors of theory contributions for a traditional methods section; such contributions do not require them, as they are not empirical in nature.
- Feel free to ask authors for minor revisions that would support replication or meta-analysis for positivist or post-positivist works, and recoverability for interpretivist works using qualitative methods.

Criterion C: The submission's methods and/or innovations soundly address its research questions.

The paper should answer the questions it poses, and it should do so with rigor, broadly construed. This is the single most important difference between research papers and other kinds of knowledge sharing in computing education (e.g., experience reports), and the source of certainty researchers can offer.

Note that soundness is relative to claims. For example, if a paper claims to have provided evidence of causality, but its methods did not do that, that would be grounds for critique. But if a paper only claimed to have found a correlation, and that correlation is a notable discovery that future work could explain, downgrading it for not demonstrating causality would be inappropriate.

Guidelines for (Meta-)Reviewers

Since soundness is relative to claims and methods, (meta-)reviewers are asked to do the following:

- Refrain from applying criteria for quantitative methods to qualitative methods (e.g., critiquing a case study for a "small N" makes no sense; that is the point of a case study).
- Refrain from downgrading work based on a lack of a statistically significant difference if the study demonstrates sufficient power to detect a difference. A lack of difference can be discovery, too.
- Refrain from asking for the paper to do more than it claims if the demonstrated claims are sufficiently publishable (e.g., "I would publish this if it had also demonstrated knowledge transfer").
- Refrain from relying on inexpert, anecdotal judgments (e.g., "I don't know much about this but I played with it once and it didn't work").
- Refrain from assuming that because a method has not been used in computing education literature that it is not standard somewhere else. The field draws upon methods from many communities. Look for evidence that the method is used elsewhere.

Criterion D: The submission advances knowledge of computing education by addressing (possibly novel) questions that are of interest to the computing education community.

A paper can meet the previous criteria and still fail to advance what we know about the phenomena. It is up to the authors to convince you that the discoveries advance our knowledge in some way, e.g., by confirming uncertain prior work, adding a significant new idea, or making progress on a long-standing open question.

Secondarily, there should be someone who might find the discovery interesting. It does not have to be interesting to a particular reviewer, and a particular reviewer does not have to be absolutely confident that an audience exists. As the PC cannot possibly reflect the broader audience of *all* readers, a *probable* audience is sufficient for publication.

Guidelines for (Meta-)Reviewers

Since advances can come in many forms, there are many criticisms that are inappropriate in isolation (if, however, many of these apply, they may justify rejection), and, thus, (meta-)reviewers are asked to do the following:

- Refrain from downgrading work because another, single paper was already published on the topic. Discoveries accumulate over many papers, not just one.
- Refrain from downgrading work that contributes a really new idea for not yet having everything figured out about it. Again, new discoveries may require multiple papers.
- Refrain from downgrading work because the results do not appear generalizable or were only obtained at a specific institution. Many papers explicitly discuss such limitations and possible remedies. Also, generalizability takes time, and, by their very nature, some qualitative methods do not lead to generalizable results.
- Refrain from downgrading work based on "only" being a replication. Replications, if done with diligence, are important.
- Refrain from downgrading work based on investigating phenomena you personally do not like (e.g., "I hate object-oriented languages, this work does not matter").

Criterion E: Discussion of results clearly summarizes the submission's contributions beyond prior work and its implications for research and practice.

It is the authors' responsibility to help interpret the significance of a paper's discoveries. If it makes significant advances, but does not explain what those advances are and why they matter, the paper is not ready for publication.

That said, it is perfectly fine if you disagree with the paper's interpretations or implications. Readers will vary on what they think a discovery means or what impact it might have on the world. All that is necessary is that the work presents some reasonably sound discussion of one possible set of interpretations.

Guidelines for (Meta-)Reviewers

Because there is no single "right" interpretation or discussion of implications, (meta-)reviewers are asked to do the following

- Refrain from downgrading work because you do not think the idea would work in your institution.
- Refrain from downgrading work because you think that the impact is limited. Check the discussion of limitations and threats to validity and evaluate the paper with respect to the claims made.
- Make sure to critically note if work makes interpretations that are not grounded in evidence or proposes implications that are not grounded in evidence.

Criterion F: The submission is written clearly enough to publish.

Papers need to be clear and concise, both to be comprehensible to diverse audiences, but also to ensure the community is not overburdened by verboseness. We recognize that not all authors are fluent English writers; if, however, the paper requires significant editing to be comprehensible to fluent English readers, or it is unnecessarily verbose, it is not yet ready for publication.

Guidelines for (Meta-)Reviewers

Since submissions should be clear *enough*, (meta-)reviewers are asked to do the following:

- Refrain from downgrading work based on having easily fixed spelling and grammar issues.
- Refrain from downgrading a sufficiently clear paper because it could be clearer. All writing can be clearer in some way.
- Refrain from downgrading work based on not using all of the available word count. It is okay if a paper is short but significant.
- Refrain from asking for more detail unless you are certain there is space or – if there is not space – you can provide concrete suggestions for what to cut.

Summary: Based on the criteria above, this paper should be published at ICER.

Based on all of the previous criteria, decide how strongly you believe the paper should be accepted or rejected, assuming authors make any modest, straightforward minor revisions you and other reviewers request before publication. Papers that meet all of the criteria should be *strongly accepted* (though this does not imply that they are perfect). Papers that fail to meet most of the criteria should be *strongly rejected*.

Each paper should be reviewed independently of others, as if it were a standalone journal submission. There are no conference presentation "slots"; there is no target acceptance rate. **Neither** should be a factor in reviewing individual submissions.

Guidelines for (Meta-)Reviewers

Because each paper should be judged on its own, (meta-)reviewers are asked to do the following:

- Refrain from recommending to accept a paper because it was the best in your set. It is possible that none of your papers sufficiently meet the criteria.
- Refrain from recommending to reject a paper because it should not take up a "slot". The PC chairs will devise a program for however many papers sufficiently meet the criteria, whether that is 5 or 50. There is no need to preemptively design the program through your review; focus on the criteria.

9. Award Recommendations

On the review form, reviewers may signal to the meta-reviewer and PC chairs that they believe the submission should be considered for a best paper award. Selecting this option in the review form is visible to the other (meta-)reviewers as part of your review, but it is not disclosed to the authors.

Reviewers should recognize papers that best illustrate the highest standards of computing education research, taking into account the quality of its questions asked, methodology, analysis, writing, and contribution to the field. This includes papers that meet all of the review criteria in exemplary ways (e.g., research that was particularly well designed, executed, and communicated), or papers that meet specific review criteria in exemplary ways (e.g., discoveries are particularly significant or sound).

The meta-review form for each paper includes an option to officially nominate a paper to the Awards Committee for the best-paper award. Reviewers may flag papers for award consideration during review, but meta-reviewers are ultimately responsible for nominating papers for the best paper award.

Each meta-reviewer may nominate at most two papers for the best paper award. Nominated papers may or may not have been flagged by one or more reviewers.

Nominations should be recorded in HotCRP and be accompanied by a paragraph outlining the rationale for nomination. NOTE: Whether a paper has been nominated and the accompanying rationale are not disclosed to the authors as part of the meta-review.

Meta-reviewers are encouraged to review and finalize their nominations at the conclusion of the SPC meeting to allow for possible calibration.

Once paper decisions have been sent, the submission chair will make PDFs and the corresponding rationales for all nominated papers available to the Awards Chair. Additionally, a list of all meta-reviewers that have handled any nominated paper or have one or more conflicts of interest with any nominated paper will be disclosed to the Awards Chair, as those members are not eligible to serve on the Awards Committee.

10.   Possible Plagiarism, Misrepresentation, and Falsification

If after reading a submission, you suspect that it has in some way plagiarized from some other source, do the following:

- Read the ACM guidelines on Plagiarism, Misrepresentation, and Falsification
- If you think there is a potential issue, write the PC chairs at *pc-chairs@icer.acm.org* to escalate the potential violation, and share any information you have about the case. Authors are required to disclose any potentially overlapping work to the PC chairs upon submission.

The chairs will investigate and decide as necessary prior to the acceptance notification deadline. You should not mark the paper for rejection based on suspected plagiarism. Mark it based on the paper as it stands, while the PC chairs investigate.

11.   Practical Suggestions for Writing Reviews

The following suggestions may be helpful when reviewing papers:

1. Before reading, remind yourself of the preceding reviewing criteria.
2. Read the paper, and as you do, note positive and negative aspects for each of the preceding reviewing criteria.
3. Use your notes to outline a review organized by the seven criteria, so authors can understand your judgments for each criterion.
4. Draft your review based on your outline.
5. Edit your review, making it as constructive and clear as possible. Even a very negative review should be respectful to the author(s), helping to educate them. Avoid comments about the author(s) themselves; focus on the document.
6. Based on your review, choose scores for each of the criteria.
7. Based on your review and scores, choose a recommendation score and decide whether to recommend the paper for consideration for a best paper award.

Thank you very much for reading this document and thank you very much for being part of the ICER reviewing process. Do not hesitate to email the Program Co-Chairs at pc-chairs@icer.acm.org if you have any questions.